



General Erosion and Sediment Control Plan

Annual Standards & Specifications

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Certification:

"I certify under penalty of law that all documents and all attachments related to the submission and updating of Western Virginia Water Authority's Annual Standards and Specifications for Erosion and Sediment Control have been prepared under my direction or supervision in a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of a fine and imprisonment for knowing violations.

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I. INTRODUCTION

The intent of this document is to establish general specifications for controlling erosion and sediment resulting from land-disturbing activities performed during the construction and maintenance of water and sewer lines and associated appurtenances within the service area of the Western Virginia Water Authority (WVWA). Appurtenances shall be defined as valves, manholes, and fire hydrants that are necessary to the working water and sewer system. These general specifications pertain to the above-mentioned practices as defined in the Virginia Erosion and Sediment Control Law, latest edition (VESCL).

Activities, such as, the installation of fences, sign posts, utility poles and their associated anchors are generally not considered land-disturbing activities as defined in the VESCL and generally fall outside the scope of this document. Land disturbing activities involving areas larger than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Areas) require site-specific erosion and sediment control plans. These plans shall be reviewed for approval by WVWA's DEQ-Certified Erosion and Sediment Control Plan Reviewers under the WVWA's Annual ESC Standards and Specifications.

Western Virginia Water Authority's Annual ESC Standards and Specifications must be filed annually with the Department of Environmental Quality (DEQ). These AS&S does not exempt or supersede other filings which may be required by other agencies.

These Annual Standards and Specifications are composed of specifications for erosion and sediment control that apply to regulated land-disturbing activities and include by reference the following:

Virginia Erosion and Sediment Control Law (§62.1-44.15:51 - §62.1-44.15:66 et seq. as amended); specifically §62.1-44.15:54.E, which specifies that entities, such as WVWA, may hold Erosion and Sediment Control Annual Standards and Specifications pursuant to §15.2-5102.

Virginia Erosion and Sediment Control Regulations (9VAC25- 840 et seq. as amended);

Virginia Erosion and Sediment Control Certification Regulations (9VAC25- 850 et seq. as amended).

II. EROSION AND SEDIMENT CONTROL — MINIMUM STANDARDS

The following are minimum standards that shall be followed in land disturbing activities as related to the construction, installation, or maintenance of water and sewer lines and appurtenances within the service area of the WVWA. However, all 19 Minimum Standards as specified in 9VAC25-840-40 shall be fulfilled as part of these Annual Standards and Specifications if applicable to a specific project.

1. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to remain dormant for more than one year.

2. During construction of a project, soil stockpiles and borrow areas shall be stabilized or protected with sediment trapping measures.
3. A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.
4. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.
5. Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.
6. Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area served by the trap or basin.
 - a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.
 - b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.
7. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.
8. Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.
9. Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.
10. All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.
11. Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.
12. When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Non-erodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by non-erodible cover materials.
13. When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of non-erodible material shall be provided.
14. All applicable federal, state, and local regulations pertaining to working in or crossing a live watercourse shall be met.
15. The bed and bank of a watercourse shall be stabilized immediately after work in the watercourse is completed.
16. Underground water and sewer lines and appurtenances shall be installed in accordance with the following standards in addition to other applicable criteria:
 - a. No more than 500 linear feet of trench may be opened at one time.
 - b. Excavated material shall be placed on the uphill side of trenches.

- c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
 - d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
 - e. Restabilization shall be accomplished in accordance with these regulations.
 - f. Applicable safety regulations shall be complied with.
17. Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner.
18. All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after temporary measures are no longer needed, unless otherwise authorized by local program authority. Trapped sediment and the disturbed soil areas shall be permanently stabilized to prevent further erosion and sedimentation.
19. Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:
- a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.
 - b. Adequacy of all channels and pipes shall be verified in the following manner:
 - (1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or
 - (2)(a) Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.
 - (b) All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and
 - (c) Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system.
 - c. If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:

- (1) Improve the channels to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to channel the bed or banks; or
- (2) Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances;
- (3) Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a ten-year storm to increase when runoff outfalls into a man-made channel; or
- (4) Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCP authority to prevent downstream erosion.

d. The applicant shall provide evidence of permission to make the improvements.

e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.

f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.

g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.

h. All on-site channels must be verified to be adequate.

i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.

j. In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.

k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.

l. Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition,

achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 62.1-44.15:54 or 62.1-44.15:65 of the Act.

m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 62.1-44.15:52 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§62.1-44.15:24 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 9VAC25-870-48 of the Virginia Stormwater Management Program (VSMP) Permit Regulations.

n. Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the Virginia Stormwater Management Program (VSMP) Permit Regulations shall be deemed to satisfy the requirements of Minimum Standard 19.

III. USE OF SPECIFIC EROSION AND SEDIMENT CONTROL PRACTICES

The most common activity that the WVWA may engage in that may require erosion and sediment control devices is the opening of trenches for the repair or replacement of water and sewer lines and appurtenances. Due to the overall small scale of most WVWA projects, seeding and the application of straw and mulch will be the most frequently utilized method of stabilization, in conformance with the requirements of Section II above. In most instances, the lines and appurtenances are installed within state or city rights-of-way with minimal slopes and no grading. However, when deemed appropriate by WVWA's DEQ Certified ESC inspectors, other devices may be used.

The use of Virginia Erosion and Sediment Control Handbook (VESCH), along with accompanying technical documents and guidance, control measures is strongly preferred. Non-VESCH control measures, best management practices (BMP), and specifications may be included in the Annual Standards and Specifications submission but their use may be further reviewed and approved by DEQ on a project-specific basis. A list of approved, non-standard VESCH measures can be found in Appendix 2. Should non-VESCH control measures fail to effectively control soil erosion, sediment deposition, and non-agricultural runoff, then VESCH control measures shall be utilized. A list of approved, non-standard VESCH measures can be found in Appendix 2.

A. Temporary Seeding (Std. & Spec. 3.31)

Temporary seeding will be applied within 7 days to all denuded areas that may not be at final grade for a period of more than 14 days. Should a condition requiring temporary seeding occur for which the WVWA is responsible, the following will be provided.

DEQ's Technical Bulletin #4 – Nutrient Management for Development Sites, which is an update to this section, shall be followed and take precedence where applicable.

1. As soon as possible after the trench is backfilled and compacted, the area is to be prepared for seeding. The soil will be raked to remove any rocks and to roughen the soil for acceptance of the seed.
2. Dependent on site conditions, construction schedules, and other variables, apply lime and fertilizer. Rates of application shall meet the suggested application rates noted in VESCH Std. & Spec 3.31. Generally, an application rate range of 46 to 138 pounds per 1000 square

- feet (2 tons per acre) for lime and 10 pounds per 1000 square feet (450 pounds per acre) of 10-10-10 fertilizer will be sufficient dependent on specific soil conditions. Lime and fertilizer will be incorporated into the top 2 to 4 inches of soil if possible.
3. If the area has recently been loosened or disturbed no further roughening is required. When the area is compacted, crusted or hardened, the soil surface will be loosened by disking, raking, harrowing, or other acceptable means.
 4. Once the surface is prepared, a seasonally appropriate seed mixture is to be applied

<u>Planting Dates</u>	<u>Species</u>	<u>Rate (lbs./ acre)</u>
9/1 - 2/15	50/50 mix of Annual Ryegrass	50 -100 and Winter Rye
2/16 - 4/30	Annual Ryegrass	60 -100
5/1 - 8/31	German Millet	50

B. Permanent Seeding (Std. & Spec 3.32)

(The Western Virginia Water Authority's service area is in the Appalachian region of the Commonwealth of Virginia.)

1. As soon as possible after the trench is backfilled and compacted, the area is to be prepared for seeding. The soil will be raked to remove any rocks and to roughen the soil for acceptance of the seed. If additional topsoil is necessary, it will be applied to provide better soil conditions for the seed.
2. Where specified by existing soil conditions, apply fertilizer and lime. Generally, an application rate of 90 pounds per 1000 square feet (2 tons per acre) for lime and 11 to 12 pounds per 1000 square feet (approximately 500 pounds per acre) of 10-20-10 fertilizer. If possible, the fertilizer and lime will be incorporated into the top 2 to 4 inches of soil.
3. Once the surface is prepared, a seed mixture of 90% Kentucky 31 Fescue and 10% Perennial Rye Grass is to be applied at a rate of 4.6 to 5.7 pounds per 1000 square feet (200 to 250 pounds per acre).
4. All permanent seeding must be mulched immediately upon completion of seed application. Refer to VESCH Std. & Spec 3.35. Straw mulch is to be applied at the rate of 70-90 pounds per 1000 square feet (1.5 to 2 tons per acre). Where there is a potential for mulching to become windblown, or where otherwise needed for stabilization reinforcement, protective coverings or a soil stabilization mat may be required, in accordance with VESCH Std. & Spec 3.36.

DEQ's Technical Bulletin #4 – Nutrient Management for Development Sites, which is an update to this section, shall be followed and take precedence where applicable.

C. Silt Fence (Std. & Spec. 3.05)

A silt fence will be used to detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site. The WVWA would use silt fences at the base of a slope where the slope has been disturbed during the installation of water and sewer lines and appurtenances. See appendices 3.05-1 and 3.05-2 for detail requirements of silt fences.

A silt fence is not to be used in an area where rock or some other hard surface prevents the full and uniform depth anchoring of the barrier.

Silt fence shall only be used where the size of the drainage area is no more than one quarter acre per 100 feet of silt fence length.

1. Design Criteria

- a. The silt fence is to be placed at the base of slopes. When the slope is at a grade of greater than 7%, an effort should be made to locate the silt fence at least 5 feet beyond the base of the slope.
- b. The use of silt fences is limited to areas where only sheet or overland flows are expected and where concentrated flows originate from drainage areas of 1 acre or less.

2. Material Specification

- a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester, or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the requirements in the following table.

<u>Physical Property</u>	<u>Test</u>	<u>Requirements</u>
Filtering Efficiency	ASTM 5141	75% Minimum
Tensile Strength @ 20% (max.) Elongation*	VTM-52	Extra Strength - 50 lbs/linear inch (min.) Standard Strength- 30 lbs/linear inch (min.)
Flow Rate	ASTM 5141	0.2 gal/sq.ft./minute (min.)
Ultraviolet Radiation Stability %	ASTM G-26	90% (minimum)

* Requirements reduced by 50% after six months

- b. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F.
- c. If wooden stakes are utilized for silt fence construction, they must have a diameter of 2 inches when oak is used and 4" when pine is used. Wooden stakes must have a minimum length of 5 feet.
- d. If steel posts are used for silt fence construction, they must have a minimum weight of 1.33 pounds per linear foot and have a minimum length of 5 feet.
- e. Wire fence reinforcement for silt fences using standard strength filter cloth shall be a minimum of 14 gauge and shall have a maximum mesh spacing of 6 inches.

3. Installation

- a. The height of a silt fence shall be a minimum of 16 inches above the original ground surface and shall not exceed 34 inches above ground elevation.
- b. The filter fabric shall be of a continuous roll cut to the length of the barrier whenever possible to avoid the use of joints. When joints are unavoidable, filter cloth shall be spliced together only at a support post, with a minimum 6 inch overlap, and securely sealed.
- c. A trench shall be excavated approximately 4" wide by 4" deep on the upslope side of the proposed location of the measure.
- d. When wire support is used, standard strength filter cloth may be used. Posts for this type

of installation shall be placed a maximum of 10 feet apart. The wire mesh fence must be fastened securely to the upslope side of the posts using heavy duty wire staples at least one inch long, tie wires or hog rings. The wire shall be extend into the trench a minimum of two inches and shall not extend more than 34 inches above the original ground surface. The standard-strength fabric shall be stapled or wired to the wire fence, and 8 inches of the fabric shall be extended into the trench. The fabric shall not be stapled to existing trees. See appendix 3.05-1.

- e. When wire support is not used, extra-strength filter cloth shall be used. Posts for this type of fabric shall be placed a maximum of 6 feet apart. The filter fabric shall be fastened securely to the upslope side of the posts using one inch long (minimum) heavy duty wire staples or tie wires and eight inches of the fabric shall be extended into the trench. The fabric shall not be stapled to existing trees. See appendix 3.05-2.
- f. If a silt fence is to be constructed across a ditch line or swale, the measure must be of sufficient length to eliminate endflow, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope. Extra-strength filter fabric shall be used for this application with a maximum 3-foot spacing of posts. (All other installation requirements noted in e. apply)
- g. The 4" by 4" trench shall be backfilled and soil compacted over the filter fabric.
- h. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

4. Maintenance

- a. Silt fences will be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
- b. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting.
- c. Should the fabric on a silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.
- d. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
- e. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

D. Storm Drain Inlet Protection (Std. & Spec. 3.07)

To prevent sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area, a sediment filter or excavated impounding area will be provided.

1. Design Criteria

- a. The drainage area shall be no greater than 1 acre.
- b. The inlet protection device shall be constructed in a manner that will facilitate cleanout and disposal of trapped sediment and minimize interference with construction activities.
- c. The inlet protection device shall be constructed in a manner that any resultant ponding of storm water will not cause excessive inconvenience or damage to adjacent areas or structures.
- d. For inlet protection devices utilizing stone as the chief ponding/filtering medium, VDOT #3, 357, or 5 should be used to obtain the greatest amount of filtering possible while not creating significant ponding problems.

2. Construction Specifications (See Appendix 3.07-1)

- a. Silt fence shall be 'extra strength' and cut from a continuous roll to avoid joints.
- b. Use 2 x 4—inch wood stakes, minimum 3 feet in length.

- c. Space stakes evenly around the perimeter of the inlet a maximum of 3-feet apart, and securely drive them into the ground approximately 18-inches deep.
- d. To provide needed stability to the installation, frame with 2 x 4 inch wood strips around the crest of the overflow area at a maximum of 1.5 feet above the drop inlet crest.
- e. Place the bottom 12-inches of fabric in a trench and backfill the trench with 12-inches of compacted soil.
- f. Fasten fabric securely by staples or wire to the stakes and frame. Joints must be overlapped to the next stake.
- g. If necessary, build a temporary dike on the downslope side of the structure to prevent bypass flow.

E. Culvert Inlet Protection (Std. & Spec. 3.08)

To prevent sediment from entering, accumulating in and being transferred by a culvert and associated drainage system prior to permanent stabilization of a disturbed project area.

1. The inlet protection device shall be constructed in a manner that will facilitate cleanout and disposal of trapped sediment and minimize interference with construction activities.
2. The inlet protection devices shall be constructed in such a manner that any resultant ponding of stormwater will not cause excessive inconvenience or damage to adjacent areas or structures.
3. See appendices 3.08-1 and 3.08-2 for inlet protection design criteria.
 - a. Silt fence culvert inlet protection has an expected maximum usable life of three months. The maximum drainage area shall not exceed one acre.
 - b. Culvert inlet sediment trap has maximum expected useful life of eighteen months. The maximum drainage area shall not exceed three acres.

F. Temporary Stone Construction Entrance (Std. & Spec. 3.02)

To reduce the amount of mud transported onto paved public roads by motor vehicles or runoff.

1. VDOT #1 coarse aggregate (2- to 3-inch stone) should be used.
2. The aggregate layer must be at least 6-inches thick; a minimum three inches of aggregate should be placed in a cut section to give the entrance added stability and to help secure filter cloth separator. It must extend the full width of the vehicular ingress and egress area and have a minimum 12-foot width. The length of the entrance must be at least 70 feet. The entrance should be located to provide for maximum utilization by all construction vehicles. See appendix 3.02-1

G. Dewatering Structure (Std. & Spec. 3.26)

A temporary settling and filtering device to filter sediment-laden water prior to the water being discharged from dewatering activities.

1. Portable Sediment Tank (See appendix 3.26-1)
 - a. The structure may be constructed with steel drums, sturdy wood or other materials suitable to handle the pressure requirements imposed by the volume of water.
 - b. The tank will have a minimum depth of 24 inches.
 - c. The sediment tank shall be located for easy clean-out and disposal of the trapped sediment and to minimize the interference with construction activities.
 - d. The sediment tank shall be sized based on the following formula:

$$\text{Cubic feet storage} = \text{pump discharge (gpm)} \times 16$$

- e. Once the water level nears the top of the box, the pump must be shut off while the tank

drains and additional capacity is made available.

- f. The tank shall be designed to allow emergency flow over the top of the tank.
 - g. Clean-out of the box is required once one-third of the original capacity is depleted due to sediment accumulation. The tank shall be clearly marked showing the clean-out point.
2. Filter Box — Because this device allows only a minimal settling time for sediment particles, it should only be used when site conditions restrict the use of other methods. (See appendix 3.26-2)
- a. The box selected will be made from steel, sturdy wood or other materials suitable to handle the pressure requirements imposed by the volume of water. Typically, fifty-five gallon drums will be used.
 - b. The bottom of the structure will be made porous, typically by drilling holes.
 - c. VDOT #3 Coarse Aggregate shall be placed over the holes at a minimum depth of 12 inches.
 - d. The effluent must be directed over a well-vegetated strip of at least 50 feet after leaving the base of the filter box.
 - e. The box shall be sized based on the following formula:

$$\text{Cubic feet storage} = \text{pump discharge (gpm)} \times 16$$

- f. Once the water level nears the top of the box, the pump must be shut off while the box drains.
- g. The box shall be designed/constructed to allow emergency flow over the top of the box.
- h. Clean-out of the box is required once one-third of the original capacity is depleted due to sediment accumulation. The tank shall be clearly marked showing the clean-out point.
- i. If the stone filter does become clogged with sediment so that it no longer adequately performs its function, the stones must be pulled away from the inlet, cleaned and replaced.

H. Temporary Diversion Dike (Std. & Spec. 3.09)

To divert storm runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabilized outlet. It can also be used to divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin.

1. The maximum allowable drainage area is 5 acres.
2. Refer to Plate 3.09-1 in the appendix for construction dimension criteria.
3. Must be installed as a first step in the land-disturbing activity and must be functional prior to upslope land disturbance.
4. The dike should be adequately compacted to prevent failure.
5. Temporary or permanent seeding and mulch shall be applied to the dike immediately following its construction.

I. Temporary Fill Diversion (Std. & Spec. 3.10)

To divert storm runoff away from the unprotected slope of the fill to a stabilized outlet or sediment-trapping facility.

1. The maximum allowable drainage area is 5 acres.
2. Refer to Plate 3.10-1 in the appendix for construction dimension criteria.
3. The diversion shall be constructed at the top of the fill at the end of each work day as needed.
4. The supporting ridge shall be constructed with a uniform height along its entire length. Without uniform height, the fill diversion may be susceptible to breaching.

J. Temporary Right-of-Way Diversion (Std. & Spec. 3.11)

To shorten the flow length within a sloping right-of-way, thereby reducing the erosion potential by diverting storm runoff to a stabilized outlet.

1. Refer to Plate 3.11-1 in the appendix for construction dimension criteria.
2. The diversion shall be installed as soon as the right-of-way has been cleared and/or graded.
3. All earthen diversions shall be machine or hand compacted in 8-inch lifts.
4. Earthen diversions which will not be subject to construction traffic should be stabilized in accordance with Temporary Seeding (Std. & Spec. 3.31).

K. Diversion (Std. & Spec. 3.12)

To reduce slope length and to intercept and divert stormwater runoff to stabilized outlets at non-erosive velocities.

1. Refer to Plate 3.12-1 in the appendix for construction and design criteria.
2. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the diversion.

IV. STREAM CROSSINGS (Std. & Spec. 3.24, 3.25)

Wherever practical any pipeline crossing of a live watercourse will be completed by boring to avoid disturbance of the stream bed and banks. When not practical, one of the following methods will be used. Site specific permits will be filed with the appropriate agencies as required. See appendices 3.24-2, 3.25-3.

A. Temporary Vehicular Stream Crossing (Std. & spec. 3.24)

A temporary structural span installed across a flowing watercourse for use by construction traffic. Structures may include bridges, round pipes, pipe arches, or oval pipes. Generally applicable to flowing streams with drainage areas less than 1 square mile.

1. Design Criteria — Temporary Culvert Crossing
 - a. Where culverts are installed, VDOT #1 Coarse Aggregate or larger will be used to form the crossing. The depth of stone cover over the culvert shall be equal to one-half the diameter of the culvert or 12 inches, whichever is greater. To protect the sides of the stone from erosion, riprap shall be used and designed in accordance with Std. & Spec. 3.19, riprap. See appendix 3.24-2.
 - b. If the structure will remain in place for up to 14 days, the culvert shall be large enough to

convey the flow from a 2-year frequency storm without appreciably altering the stream flow characteristics. Table 3.24-A may be utilized in selecting an appropriate culvert size. If the structure will remain in place from 14 days to 1 year, the culvert shall be large enough to convey the flow from a 10 year frequency storm. In this case the hydrologic calculation and subsequent culvert size must be done for the specific watershed characteristics. If the structure must remain in place more than 1 year, it must be designed as a permanent measure by a qualified professional.

- c. Multiple culverts may be used in place of one large culvert if they have the equivalent capacity of the larger one. The minimum size culvert that may be used is 18 inches.
- d. All culverts shall be strong enough to support their cross-sectioned area under maximum expected loads.
- e. The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes.
- f. The slope of the culvert shall be at least 0.25 inch per foot.
- g. The temporary waterway crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location.
- h. The centerline of both roadway approaches shall coincide with the crossing alignment centerline for a minimum distance of 50 feet from each bank of the waterway being crossed. If physical or right-of-way restraints preclude the 50 feet minimum, a shorter distance may be provided. All fill materials associated with the roadway approach shall be limited to a maximum height of 2 feet above the existing flood plain elevation.
- i. The approaches to the structure shall consist of VDOT #1 stone 6 inches thick with a minimum width equal to the width of the structure.
- j. A water diverting structure such as a swale shall be constructed (across the roadway on both roadway approaches) 50 feet maximum on either side of the waterway crossing. The 50 feet is measured from the top of the waterway bank.

TABLE 3.24-A PIPE DIAMETER (INCHES) FOR STREAM CROSSINGS*				
Drainage Area (Ac)	Average Slope of Watershed			
	1%	4%	8%	16%
1-25	24	24	30	30
26-50	24	30	36	36
51-100	30	36	42	48
101-150	30	42	48	48
151-200	36	42	48	54
301-350	42	48	60	60
351-400	42	54	60	60
451-500	42	54	60	72
501-550	48	60	60	72
551-600	48	60	60	72
601-640	48	60	72	72
Note: Table is based on USDA - SCS Graphical Peak Discharge Method for 2-year frequency storm event, CN = 65; Rainfall depth = 3.5 inches (average for Virginia)				

Source: Va. DSWC

B. Flume Pipe Crossing (Std. & spec. 3.25)

To be used when in-stream construction will last less than 72 hours and the stream is narrow (less than 10 feet wide) making "cofferdam" construction impractical.

1. The flume pipe crossing must be made operational prior to the start of construction in the stream.
2. The material used (culvert(s), stone, and filter fabric) must meet the physical constraints of those found in the Virginia Department of Environmental Quality's Virginia Erosion and Sediment Control Handbook (Third Edition, 1992), Standards and Specifications 3.24, "Vehicular Stream Crossing".
3. A large flume pipe (or culvert) of an adequate size to support normal water channel flow shall then be installed in the stream bed across the proposed pipeline trench centerline. See table 3.24-A above. VDOT #1 Coarse aggregate (minimum size) or riprap shall be placed close to each end of the flume pipe so as to dam off the creek forcing the water to flow through the flume pipe. See appendix 3.25-3.
4. The entrapped water can then be pumped from the creek within the dammed off area and in the proposed trench centerline into an appropriate dewatering structure. The trench can then be dug under the flume pipe. The pipe sections will then be installed to the proper depth under the flume pipe. After the pipe sections are installed, the ditch will then be backfilled and restabilization shall be carried out.
5. Restabilization shall consist of the installation of ungrouted riprap on all disturbed stream bank areas (or on the area six feet on both sides of the trench line, whichever is greater) with slopes of 3:1 or greater. For slopes of 3:1 or less, vegetative stabilization may be used, pending approval by the Plan-Approving Authority or Inspection Authority. Stabilization of its streambed and banks and the approach areas should occur immediately following the attainment of final grade.
6. After completion of backfilling operation and restoration of stream/creek banks and leveling of stream bed, the flume pipe shall be removed. The gravel can be removed or spread in the stream bed depending on permit requirements. Sediment control in approach areas shall not be removed until all construction is completed in stream/creek crossing area. All ground contours shall be returned to their original condition.

C. Cofferdam Crossing (Std. & Spec. 3.25)

The cofferdam crossing will be required on any stream crossing where the stream is 10 feet or wider.

1. Construction is to be performed in low flow periods.
2. Crossing shall be accomplished in a manner that will not prohibit the flow of the stream.
3. As with all utility line crossings, approach areas must be controlled with perimeter measures such as silt fence or straw bales.
4. Remove large rocks, woody vegetation, or other material from the streambed and banks that may get in the way of placing riprap, sandbags, sheet metal, or wood planks or installing the pipeline.
5. Form a cofferdam by placing the riprap (or other non-erodible materials) in a semicircle along the side of the stream in which the pipeline installation will begin. It must be surrounded and underlain with filter cloth as shown in appendix 3.25-4, the height of and area within the dam will depend on the size of the work area and the amount of stream flow. Stack materials as high as will be necessary to keep water from overtopping the dam and flooding the work area. When the stream flow is successfully diverted by the cofferdam, dewater the work area and stabilize it with aggregate (VDOT #57 or #68 Coarse Aggregate)

- or sand. The water must be discharged into a sediment trapping device.
6. Install the pipeline in half the streambed as shown in appendix 3.25-4.
 7. Remove the riprap or other materials and begin placing them on the other side of the stream.
 8. Restabilization shall consist of the installation of ungrouted riprap on all disturbed streambank areas (or on the area 6 feet on both sides of the centerline of the pipeline trench, whichever is greater) with slopes of 3:1 or greater. For slopes of 3:1 or less, vegetative stabilization may be used, pending approval by the governing jurisdiction. Stabilization of its streambed and banks and the approach areas should occur immediately following the attainment of final grade
 9. Maintenance — The area must be inspected daily to ensure the construction materials are positioned securely. This is to ensure the work area stays dry and no construction materials float downstream.

V. RIGHT OF WAY MAINTENANCE

Rights of way will be maintained in a manner that will not damage the root mass of the existing foliage. Vegetative coverage on right of way locations has become well established through the years. The areas will be cut or trimmed in a manner that will not promote erosion. All areas cleared will be monitored for evidence of erosion subsequent to clearing operations. Should erosion and sediment control measures within the ROW be necessary due to maintenance activities, temporary diversion dike, temporary fill, or appropriate diversion will be constructed and maintained. See appendices 3.10-1, 3.11-1, and 3.12-1. Please refer to Guidance Memo 16-2001, specifically Table 1, Land Cover Guidance as it contains information for utility rights-of-ways as forest and open space.

VI. OTHER ESC PRACTICES

- A. Directional Drilling — Directional drilling is a method of trenchless excavation that can be a tool to minimize erosion and sediment control issues. By boring either along or down steep slopes, the need for stabilization and the potential for a failure is eliminated. The primary concern with directional drilling activities is the retention and removal of the drilling fluids. This fluid is generally a bentonite slurry that quickly hardens on the ground surface. When this method is used, a proper silt fence, as described in Section III. B., shall be used to eliminate runoff of the drilling fluids. The retained bentonite will be properly removed and disposed of.
- B. Trenching operations — Typically trenching is not performed in inclement weather, and trenches are to be closed on a daily basis. Groundwater levels are generally below the level of the bottom of the trench, reducing the need to address runoff from within trenches. Should removal of water in a trench be required, a nonwoven geotextile fabric sack will be utilized. The sediment-laden water is pumped into the sack and fabric traps the sand, silt, and fines within the sack while allowing relatively sediment-free water to pass through. Sacks made by several manufacturers are available in a range of sizes to meet different site requirements.

Installation

Install the bag on a slope so that the incoming water flows downhill through the bag without creating more erosion. Strap the neck of the bag to the discharge hose. To increase the efficiency of filtration, place the bag on an aggregate or straw bale bed to maximize water flow through the surface area of the bag.

The bag is full when it no longer can efficiently filter sediment or pass water at a reasonable rate. Flow rates will vary depending on the size of the bag; the type and amount of sediment

discharged into the bag; the type of ground, rock, or other substance under the bag, and the degree of slope on which the bag lies.

Maximum flow rate under optimal conditions is 1,500 gallons per minute. Dispose of the bag as directed by the certified representative. If allowed, the bag may be cut open and contents graded and seeded. Facilitate off-site disposal by placing the bag in the back of a dump truck or flat bed prior to its use, and allow the water to drain from the bag in-place. See Filter Bag Detail in appendix.

VII. PROJECT SPECIFIC INFORMATION

For projects meeting the definition of land disturbing activity, DEQ will be immediately notified of such activity at least two weeks in advance of any construction through an e-notification sent to StandardsandSpecs@deq.virginia.gov.

E-Notifications Project Information:

The Project Information shall consist of the following items for each project: project name or project number, project location (including nearest major intersection, latitude and longitude, and access point), locality, on-site project manager name and contact information, project description, acreage of disturbed area for project, project start and finish dates. Also include any variances/exemptions/waivers and deviations associated with each project.

The Certified Responsible Land Disturber (RLD) information to be provided is the RLD's name, contact information and certification number. An electronic copy of this notification will be kept for project tracking purposes.

Project Tracking Information:

The Authority shall submit a summary to the DEQ providing project information similar to that as listed above for the E-Notifications for all active projects that fall under the regulation of the Authority's approved Annual Standards and Specifications. WVWA will submit project information to DEQ bi-annually for all ESC regulated land disturbing activities (by end of June and end of December)

VIII. CERTIFICATION, INSPECTION, TRAINING, AND REPORTING

- A. The DEQ Certified ESC Inspector shall provide for, and document, inspections at the following frequency: during and/or immediately following initial installation of erosion and sediment controls, at least once in every fourteen days, within 48 hours following any runoff producing storm event, and at the completion of the project. All projects that require an ESC plan shall require a DEQ Certified ESC Responsible Land Disturber. The DEQ Certified ESC RLD will be responsible for inspecting each ESC control measure in accordance with the VESCH.
- B. Safety, Environmental Protection, and Reporting — WVWA employees, inspectors, and contractors are directed to perform all work to minimum OSHA safety standards. Additionally, they are directed to protect the environment at all times and to report any violations of environmental rules, including erosion and sediment control issues, to their respective supervisor immediately.
- C. Record Retention – The AS&S holder (WVWA) shall maintain, both on-site and in AS&S files, a copy of the approved ESC plan and a record of inspections for each active land-disturbing activity.
- D. DEQ Certified ESC Personnel: (The following roles are for ESC only, not SWM, as the WVWA's

AS&S are for ESC purposes only. SWM will be administered by the local VSMP.)

Will Bulloss – DEQ Certified ESC Program Administrator – Certification #ESPA0239

Trent Cox – DEQ Certified ESC Combined Administrator - Certification #6007

- The DEQ Certified ESC Combined Administrator shall be responsible for performing all of the following duties regarding the WVWA's ESC AS&S: Plan review, plan administration, and project inspection.

Mark Sink – DEQ Certified ESC Inspector - Certification #5511

Kenneth Winslow – DEQ Certified ESC Inspector - Certification #5885

Charlie Crush – DEQ Certified ESC Inspector - Certification #ESIN0115

Brian Whitenack – DEQ Certified ESC Inspector - Certification #ESIN0309

- Each of the above DEQ Certified ESC Inspectors will be responsible for project inspection on projects that require an ESC plan under the WVWA's AS&S.
- All projects requiring an ESC Plan and administered under the WVWA's AS&S shall have a DEQ Certified ESC Responsible Land Disturber, which will typically be a sub-contractor to the WVWA.
- The WVWA will follow all ESC Certification Regulations under the Virginia Administrative Code 9VAC25-850.

E. DEQ Oversight:

1. Complaints and Inspections –

The Department shall perform random site inspections or inspections in response to a complaint to assure compliance with this article, the Erosion and Sediment Control Law, and regulations adopted thereunder. The Department may take enforcement actions in accordance with this article and related regulations.

2. Annual Submittal to DEQ Enforcement -

The Department and the Board, where applicable, shall provide project oversight and enforcement as necessary and comprehensive program compliance review and evaluation. The Department may take enforcement actions in accordance with this article and related regulations.

3. Fees –

The Board shall have the authority to enforce approved specifications and charge fees equal to the lower of (i) \$1,000 or (ii) an amount sufficient to cover the costs associated with standard and specification review and approval, project inspections, and compliance.

E. Additional Reporting:

Inspection reports conducted by WVWA as well as complaint logs and complaint responses may be required to be submitted to DEQ. WVWA may be required to provide weekly e-reporting to the department's applicable regional office:

1. Inspection reports;

2. Pictures;
3. Complaint logs and complaint responses; and
4. Other compliance documents.

F. Variance and Exception Requests:

DEQ will consider variance requests freestanding of this Annual Standard and Specification submission and on a site-specific basis. WVWA may (at DEQ's discretion) be required to produce documentation to demonstrate the applicability of variance requests. The following information may be required for the review of variance requests:

1. Introduction
2. Project Description
3. Minimum Standards and Variance Requests
4. Existing Conditions and Adjacent Areas
5. Soil Characterization
6. Critical and Sensitive Areas (Karst, Wetland, Etc.)
7. Mitigation
 - a. ESC Measures
 - b. Permanent Stabilization
 - c. Vegetative Restoration
 - d. Maintenance
 - e. Critical and Sensitive Areas
8. Self-inspection, Reporting and DEQ-Certified Personnel

IX. PLAN REQUIREMENTS

Any site-specific ESC plan for a regulated land disturbing activity administered by the Western Virginia Water Authority shall be prepared in accordance with these Annual Standards and Specifications and the erosion and sediment control plan requirements as specified in the latest edition of the Virginia Erosion and Sediment Control Handbook (VESCH).

WVWA shall ensure that each site-specific plan for regulated land disturbing activity that is undertaken under these Annual Standards and Specifications shall be reviewed by a DEQ-certified ESC Plan Reviewer. Final plans shall be signed and sealed by the design professional who prepared the plans and shall be stamped approved by the ESC Program Administrator, or designee.

In compliance with § 62.1-44.15:55 of the Virginia Erosion and Sediment Control Law, on-site changes to the individual project specific plan may occur when adequate documentation of the changes are shown on the individual project specific plan.

Any additional (off-site) areas that will be disturbed in correlation to a WVWA project that is outside of the boundaries of the specific linear project, such as "borrow" or "waste" areas shall be submitted to the local VSMP for review and approval. This additional submittal requirement shall be the responsibility of the actual Contractor who is utilizing the off-site disturbance. WVWA shall require the contractor to

provide identification of any off-site areas to be used, and shall also require submission of applicable approval documentation for off-site areas prior to authorizing land-disturbing activities.

X. STORMWATER MANAGEMENT

Any WVWA project that meets the stormwater threshold for land disturbance such as, construction activities resulting in land disturbance equal to or greater than one acre, or 2,500 square feet in a Chesapeake Bay Preservation Area, shall have the plans submitted to the local VSMP where the project takes place for their review. The local VSMP may take into consideration the DEQ Guidance Memo No.15-2003 when reviewing any linear project submitted by the WVWA. In the event that all requirements of the Guidance Memo No. 15-2003 are addressed and met, the WVWA will ask the local VSMP to waive the requirement for the preparation and implementation of a stormwater management plan and the Construction General Permit. WVWA will maintain its Annual Standards and Specifications on the Authority website.

Appendices

Appendix 1

Appendix 1
Table 1 of VA DEQ Guidance Memo 16-2001

Table 1. Land Cover Guidance for VRRM Compliance Spreadsheets

FOREST & OPEN SPACE
<p>Land that will remain undisturbed OR restored to a hydrologically functional state¹:</p> <ul style="list-style-type: none"> • Portions of residential lots that will NOT be disturbed during construction • Portions of roadway rights-of-way that, following construction, will be used as filter strips, grass channels, or stormwater treatment areas; MUST include soil restoration or placement of engineered soil mix as per design specifications • Community open space areas that will not be mowed routinely, but left in a natural vegetated state (can include areas bush hogged no more than four times per year) • Utility rights-of-way that will be left in a natural vegetated state (can include areas bush hogged no more than four times per year) • Surface area of stormwater BMPs that are NOT wet ponds, have some type of vegetative cover, and that do not replace an otherwise impervious surface² <ul style="list-style-type: none"> ○ BMPs in this category include bioretention, dry swale, grass channel, extended detention (ED) pond that is not mowed routinely, stormwater wetland, soil amended areas that are vegetated, and infiltration practices that have a vegetated cover • Other areas of existing forest and/or open space, including wetlands, that will be protected during construction and that will remain undisturbed <p>Operational & management conditions for land cover in Forest & Open Space category:</p> <ul style="list-style-type: none"> • Undisturbed portions of yards, community open space, and other areas that will be considered as forest/open space must be shown outside the limits of disturbance (LOD) on approved erosion and sediment control plans AND demarcated in the field (e.g., fencing) prior to commencement of construction • Portions of roadway rights-of-way that will count as forest/open space are assumed to be disturbed during construction, and must follow the most recent design specifications for soil restoration and, if applicable, site reforestation, as well as other relevant specifications if the area will be used as a filter strip, grass channel, bioretention, or other BMP • All areas that will be considered forest/open space for stormwater purposes must have documentation that prescribes that the area will remain in a natural, vegetated state <ul style="list-style-type: none"> ○ Appropriate documentation includes: subdivision covenants and restrictions, deeded operation and maintenance agreements and plans, parcel of common ownership with maintenance plan, third-party protective easement, within public right-of-way or easement with maintenance plan, or other documentation approved by the local program authority • Although the goal is to have forest/open space areas remain undisturbed, some activities may be prescribed in the appropriate documentation, as approved by the local program authority: <ul style="list-style-type: none"> ○ Forest management, control of invasive species, replanting and revegetating, passive recreation (e.g., trails), limited bush hogging to maintain desired vegetative

community, etc.
MANAGED TURF
<p>Land disturbed and/or graded for eventual use as managed turf:</p> <ul style="list-style-type: none"> • Portions of residential yards that are graded or disturbed, including yard areas, septic fields, residential utility connections • Roadway rights-of-way that will be mowed and maintained as turf • Turf areas intended to be mowed and maintained as turf within residential, commercial, industrial, and institutional settings
IMPERVIOUS COVER
<ul style="list-style-type: none"> • Roadways, driveways, rooftops, parking lots, sidewalks, and other impervious areas <p>This category also includes the surface area of stormwater BMPs that: (1) are wet ponds, OR (2) replace an otherwise impervious surface (e.g., green roof, pervious parking) ¹</p>
<p>¹Pre-redevelopment areas that are undisturbed and naturally vegetated are considered forest/open space in the redevelopment spreadsheet.</p> <p>²Certain stormwater BMPs are considered impervious with regard to the land cover computations. These BMPs are still assigned Runoff Reduction and/or Pollutant Removal rates within the spreadsheet, so their “values” for stormwater management are still accounted for. The reason they are considered impervious is that they either do not reduce runoff volumes (e.g., wet ponds) OR their Runoff Reduction rates are based on comparison to a more conventional land cover type (e.g., green roofs, pervious parking).</p>

Appendix 2

Non-VESCH Specification

NON-VESCH SPECIFICATION

Proprietary ESC measures previously used on WVWA projects are listed below.

Use of these or any other non-VESCH measure is not endorsed by WVWA, nor does selection of a measure from this list relieve the designer and installer from all appropriate responsibilities regarding performance, maintenance, or replacement due to inadequacy.

VESCH Standard and Specification 3.05

- ACF Environmental Silt Fence

Inlet Protection (VESCH Standard and Specification 3.07)

- ACF Environmental Gutterbuddy Curb Inlet Drain Filter
- ACF Environmental GutterEEL Curb Inlet Drain Filter
- ACF Environmental SiltSack Sediment Capture Device
- Dandy Bag Inlet Protection
- Dandy Curb Grateless Curb Inlet and Median Barrier Inlet Protection System
- Dandy Curb Bag Curb and Gutter Inlet/Grate Protection System
- Dandy Curb Sack Curb and Gutter Protection System
- Dandy Pop (Pop- up Dandy Bag) Inlet Protection System
- Dandy Sack Inlet Protection System
- Rapid Flow Drain Filter – Polystyrene Aggregate

Dewatering (VESCH Standard and Specification 3.26)

- Dandy Dewatering Bag
- ACF Dirtbag Dewatering Bag

Manufacturer-supplied product-specific documentation and specifications are provided in the following pages.

ACF FB FABRIC

TECHNICAL DATA SHEET

WOVEN MONOFILAMENT GEOTEXTILE

ACF FB is manufactured using high tenacity polypropylene yarns woven to form a dimensionally stable network which allows the yarn to maintain their relative position. It has been stabilized to resist degradation due to ultraviolet exposure and is resistant to commonly encountered mildew, insects and soil chemicals, and is non-biodegradable.

SPECIFICATIONS:

The ACF FB polypropylene woven fabric will utilize the following characteristics:

PROPERTY	TEST METHOD	MAXIMUM AVG ROLL VALUE
Grab Tensile Strength	ASTM D4632	260 x 180 lbs
Grab Tensile Elongation	ASTM D4632	15 x 15%
UV Resistance (500 hrs)	ASTM D4355	80%
Apparent Opening Size (AOS)	ASTM D4751	30 US Std Sieve
Mullen Burst	ASTM D3786	175 psi
Water Flow Rate	ASTM D4491	75 gpm/ft ²

PROPERTY	TYPICAL ENGLISH
Roll Dimensions	36 in x 330 ft
	36 in x 2250 ft

Disclaimer: ACF Environmental assumes no liability for the completeness or accuracy of this information or the ultimate use of this information. This document should not be construed as engineering advice. Always consult the project engineer for project specific requirements. The end user assumes sole responsibility for the use of this information and product.

ACF VSF

TECHNICAL DATA SHEET

WOVEN GEOTEXTILE

ACF VSF is manufactured using high tenacity polypropylene yarns woven to form a dimensionally stable network, which allows the yarns to maintain their relative positive. ACF VSF resists ultraviolet deterioration, rotting, and biological degradation and is inert to commonly encountered soil chemicals.

SPECIFICATIONS:

The ACF VSF polypropylene woven fabric will utilize the following characteristics:

PROPERTY	TEST METHOD	MIN. AVG. ROLL VALUE
Grab Tensile Strength	ASTM D4632	150 lbs
Grab Tensile Elongation	ASTM D4632	> 15%
UV Resistance @ 500 hrs	ASTMD4355	> 70%
Apparent Opening Size (AOS)	ASTM D4751	30 US Sieve
Permittivity (sec ⁻¹)	ASTM D4491	0.15 (sec ⁻¹)
Flow Rate	ASTM D4491	12 gpm/ft ²

Values quoted above are the result of multiple tests conducted at an independent testing facility. ACF VSF meets or exceeds values listed.

Mullen burst ASTM D-3786 has been removed. It is not recognized by ASTM D-35 on Geosynthetics.

Puncture ASTM D-4833 has been removed. It is not recognized by AASHTO M288 and has been replaced with CBR Puncture ASTM D-6241.

Disclaimer: ACF Environmental assumes no liability for the completeness or accuracy of this information or the ultimate use of this information. This document should not be construed as engineering advice. Always consult the project engineer for project specific requirements. The end user assumes sole responsibility for the use of this information and product.



"ACF Environmental successfully complies with AASHTO's NTPEP Geotextiles Technical Committee Work Plan" Approved by

VDOT for use as a temporary silt fence fabric under Section 245.03(a).

6 2017

GUTTERBUDDY™

CURB INLET DRAIN FILTER

INLET PROTECTION

Prevents sediment, debris and other pollutants from entering stormwater systems.

GutterBuddy™ is designed for curb inlets without grates where water flow is critical. The filtering action lets water freely flow through the fibrous material while stopping sediment and debris. Built-in overflows drain water even more quickly during extreme events.

Long lasting GutterBuddy™ Curb Inlet Filters are flexible enough to conform to any curb radius, allowing for quick and easy installation. These inlet filters are 9" in diameter and can be purchased in the following lengths:

- | | | | |
|------|-------|-------|-------|
| - 4' | - 8' | - 12' | - 16' |
| - 6' | - 10' | - 14' | |



ADVANTAGES:

- Lightweight and easy to install
- Easy to maintain and reusable
- Available in 4' - 16' lengths (Should be 2' longer than curb opening)
- Keeps out sand, asphalt millings and other fine sediment
- Washable and reusable

12.18

GUTTEREEL™

CURB INLET FILTER

INLET PROTECTION

Removes sediment, trash and debris from stormwater runoff.

GutterEEL™ is a highly effective curb inlet sediment control filter used to remove suspended soils, trash and debris from stormwater runoff.

This curb inlet filter is designed with a built-in overflow weir to prevent ponding during heavy storm events. The weight of the unit holds it firmly in place close to the curb face and its durability allows the unit to be easily cleaned and reused from job to job. The unit is available in 6' and 9' lengths.

Filter sleeve is composed of 100% shredded, recycled tire rubber.



ADVANTAGES:

- Designed with high-flow overflow weir for extreme wet weather events
- High-flow / high strength outer filter
- Easy to install, use, and reuse
- Filter media composed of 100% recycled, shredded tires
- Weight of unit holds it securely to curb surface



Floccin GutterEEL™ with Floc Snakes attached

SILTSACK®

SEDIMENT CAPTURE DEVICE

INLET PROTECTION

PROTECTS CATCH BASINS FROM CONSTRUCTION RUNOFF

Siltsack® is a temporary catch basin filter that removes sediment, trash and debris from entering a catch basin. Available in both high flow and regular flow, Siltsack can be manufactured with built-in curb deflectors and overflow holes.

Routine inspection of Siltsack's collected sediment level is important to prevent ponding around catch basins.

FEATURES:

- Two dump straps attached at the bottom to facilitate emptying
- Lifting loops to remove sack from basin
- Restraint cord to keep sides away from basin walls
- Multiple types of Siltsack available
 - **Type A:** original Siltsack
 - **Type B:** Siltsack with curb deflector
 - **Type C:** Siltsack with adjustable frame

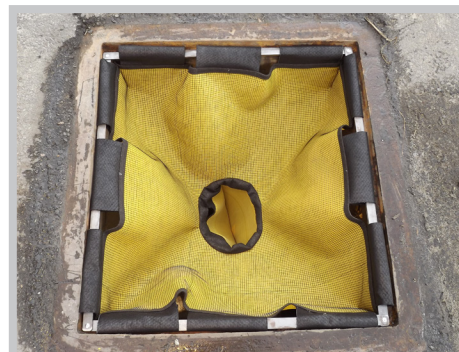


ADVANTAGES:

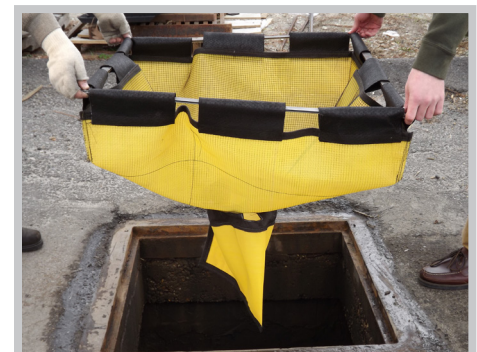
- Made to fit any size inlet
- Easy to install and economical
- US patented
- Custom sizes available
- Undergrate design so it is not easily disturbed
- Type C has adjustable frame



TYPE A



TYPE C



TYPE C

SPECIFICATIONS

Siltsack is manufactured from woven polypropylene geotextile and fits the opening of a catch basin or drop inlet.

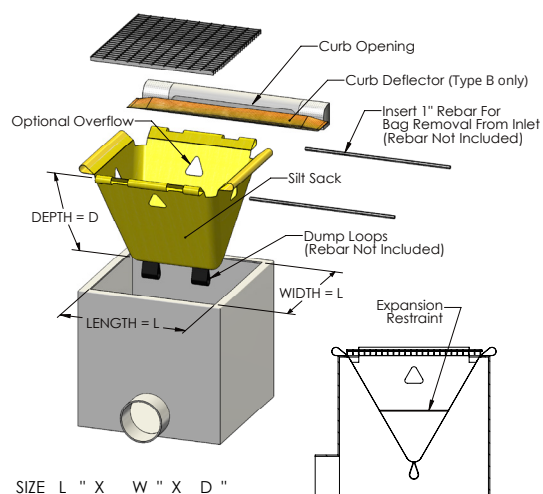
Specs for Siltsack Regular Flow

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile	ASTM D4632	lbs	281 x 170
Grab Elongation	ASTM D4632	%	16 x 7
Puncture	ASTM D6241	lbs	1005
Trapezoid Tear	ASTM D4533	lbs	85 x 61
AOS	ASTM D4751	US Sieve	30
Flow Rate	ASTM D4491	gal/min/ft ²	38.5
Permittivity	ASTM D4491	sec ⁻¹	0.51

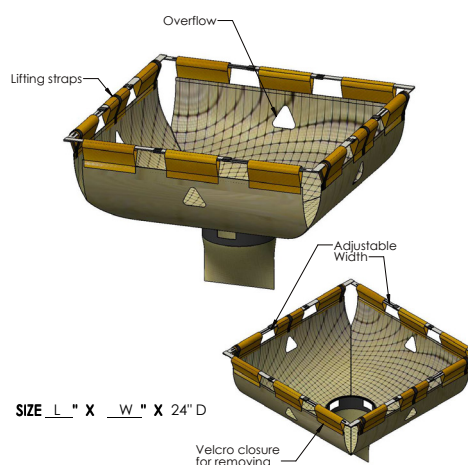
Specs for Siltsack High Flow

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile	ASTM D4632	lbs	274 x 237
Grab Elongation	ASTM D4632	%	27 x 12
Puncture	ASTM D6241	lbs	754
Trapezoid Tear	ASTM D4533	lbs	63 x 56
AOS	ASTM D4751	US Sieve	20
Flow Rate	ASTM D4491	gal/min/ft ²	250
Permittivity	ASTM D4491	sec ⁻¹	3.45

TYPE A AND B



TYPE C



ACF Silt Sack®
Inlet Protection System Guide Specification

Product:

ACF Silt Sack®

Manufacturer:

ACF Environmental

2831 Cardwell Road

Richmond, VA 23234

Phone: 800-448-3636

E-mail: info@acfenv.com

Web: www.acfenvironmental.com

1.0 Description of Work

1.1 This work shall consist of furnishing, installing, maintaining, and removing Silt Sack® sediment control device as directed by the engineer or as shown on the site drawings.

2.0 Silt Sack® Materials

2.1 There are 4 types of Silt Sack®:

Type A: Standard Silt Sack® (overflows optional)

Type B: Standard Silt Sack® with curb deflector (overflows optional)

Type C: Standard Silt Sack® with adjustable frame (overflows optional)

2.2 Silt Sack® shall be manufactured from a specially designed woven polypropylene geotextile and sewn by a double needle machine, using a high strength nylon thread.

Silt Sack® seams have been tested by a third party laboratory under ASTM D-4884 (Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles). The results are listed in Table 1 & 2 below.

Table 1: Silt Sack® Regular Flow Seam Strength Results (ASTM D-4884)

Parameter	MARV	Units
Maximum Load	852	LBS
Maximum Strength	1280	LB/FT

Table 2: Silt Sack® High Flow Seam Strength Results (ASTM D-4884)

Parameter	MARV	Units
Maximum Load	800	LBS
Maximum Strength	1200	LB/FT

2.3 Silt Sack® shall be manufactured to fit the opening of the catch basin or drop inlet. Silt Sack® will have the following features: two dump straps attached at the bottom to facilitate the emptying of Silt Sack®; Silt Sack® shall have lifting straps as an integral part of the system to be used to lift Silt Sack from the basin; Silt Sack® shall have a restraint cord approximately halfway up the depth of the sack to keep the sides from expanding toward the catch basin wall (this cord is also a visual means of indicating when the sack should be emptied). Once the cord is covered with sediment, Silt Sack should be emptied, cleaned, and placed back into the basin for reuse.

2.4 The Silt Sack® unit shall utilize a woven fabric with the following characteristics:

Silt Sack® Regular Flow

Property	Test Method	Units	MARV
Grab Tensile	ASTM D-4632	LBS	281 x 170
Grab Elongation	ASTM D-4632	%	16 x 7
CBR Puncture	ASTM D-6241	LBS	1005
Trapezoid Tear Strength	ASTM D-4533	LBS	85 x 61
UV Resistance @ 500 Hours	ASTM D-4355	%	96
AOS	ASTM D-4751	U.S. SIEVE	30
Flow Rate	ASTM D-4491	GPM/FT	38.5
Permittivity	ASTM D-4491	SEC ⁻¹	0.51

Note: Property values listed above are effective September 2017 and are subject to change.

Silt Sack® High Flow

Property	Test Method	Units	MARV
Grab Tensile	ASTM D-4632	LBS	274 x 237
Grab Elongation	ASTM D-4632	%	27 x 12
CBR Puncture	ASTM D-6241	LBS	754
Trapezoid Tear Strength	ASTM D-4533	LBS	63 x 56
UV Resistance @ 500 Hours	ASTM D-4355	%	99
AOS	ASTM D-4751	U.S. SIEVE	20
Flow Rate	ASTM D-4491	GPM/FT ²	250
Permittivity	ASTM D-4491	SEC ⁻¹	3.45

Note: Property values listed above are effective September 2017 and are subject to change.

All properties are Minimum Average Roll Values (MARV)

3.0 Construction Sequence

3.1 To install Silt Sack® in the catch basin, remove the grate and place the sack in the opening. Hold approximately six inches of the sack outside the frame. This is the area of the lifting straps. Replace the grate to hold the sack in place.

3.2 When the restraint cord is no longer visible, Silt Sack® is full and should be emptied.

3.3 To remove Silt Sack®, take two pieces of 1" diameter rebar and place through the lifting loops on each side of the sack to facilitate the lifting of the Silt Sack®.

3.4 To empty Silt Sack®, place unit where the contents will be collected. Place the rebar through the lift straps (connected to the bottom of the sack) and lift. This will lift Silt Sack® from the bottom and empty the contents. Clean out and rinse. Return Silt Sack® to its original shape and place back in the basin.

3.5 Silt Sack® is reusable. Once the construction cycle is complete, remove Silt Sack® from the basin and clean. Silt Sack® should be stored out of sunlight until next use.

4.0 Basis of Payment

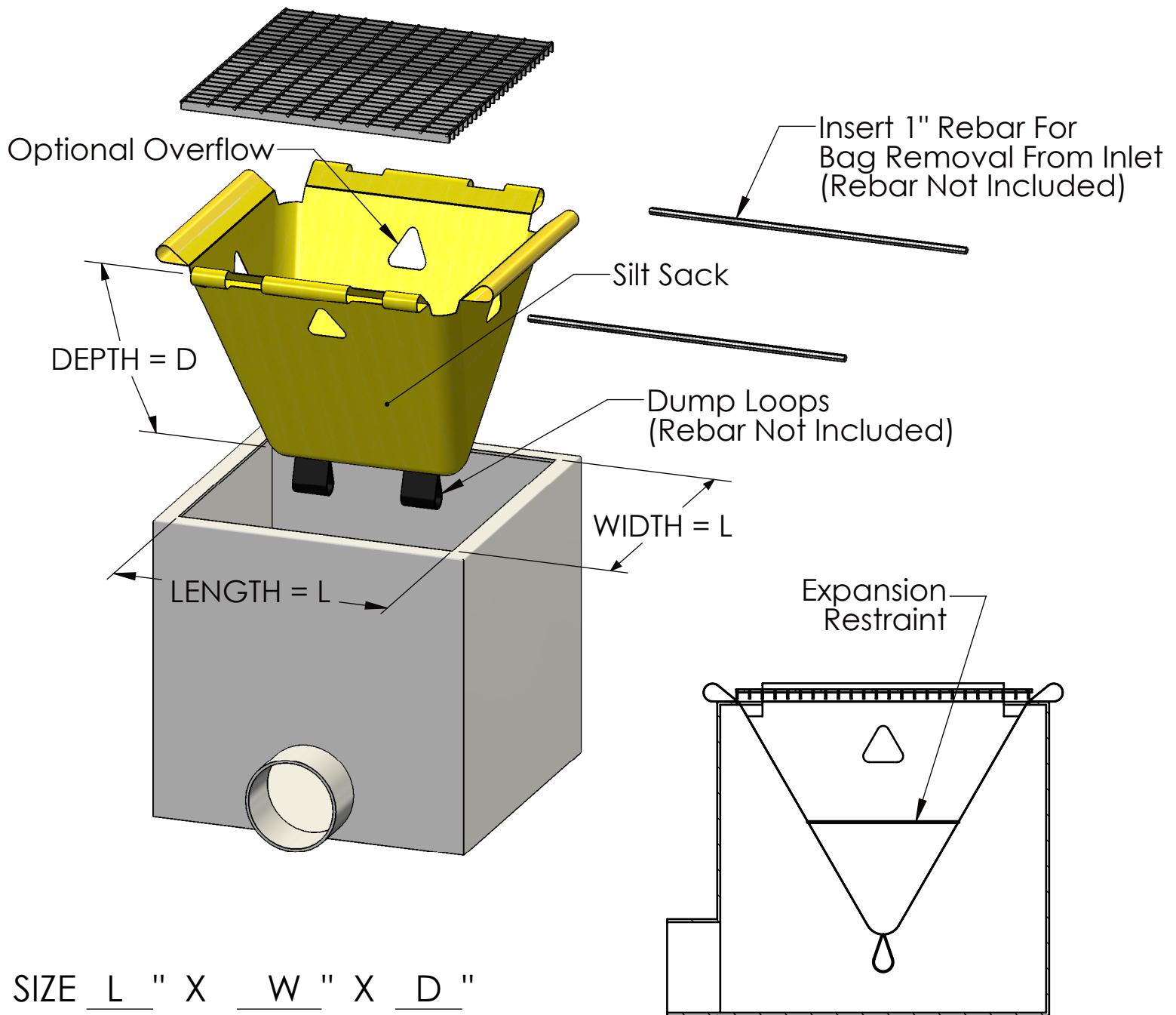
4.1 Payment for all Silt Sack® units used during construction is to be included in the bid price for the overall erosion and sediment control plan unless unit price is requested.

*** Silt Sack® is covered by U.S. Patent No. 5,575,925**

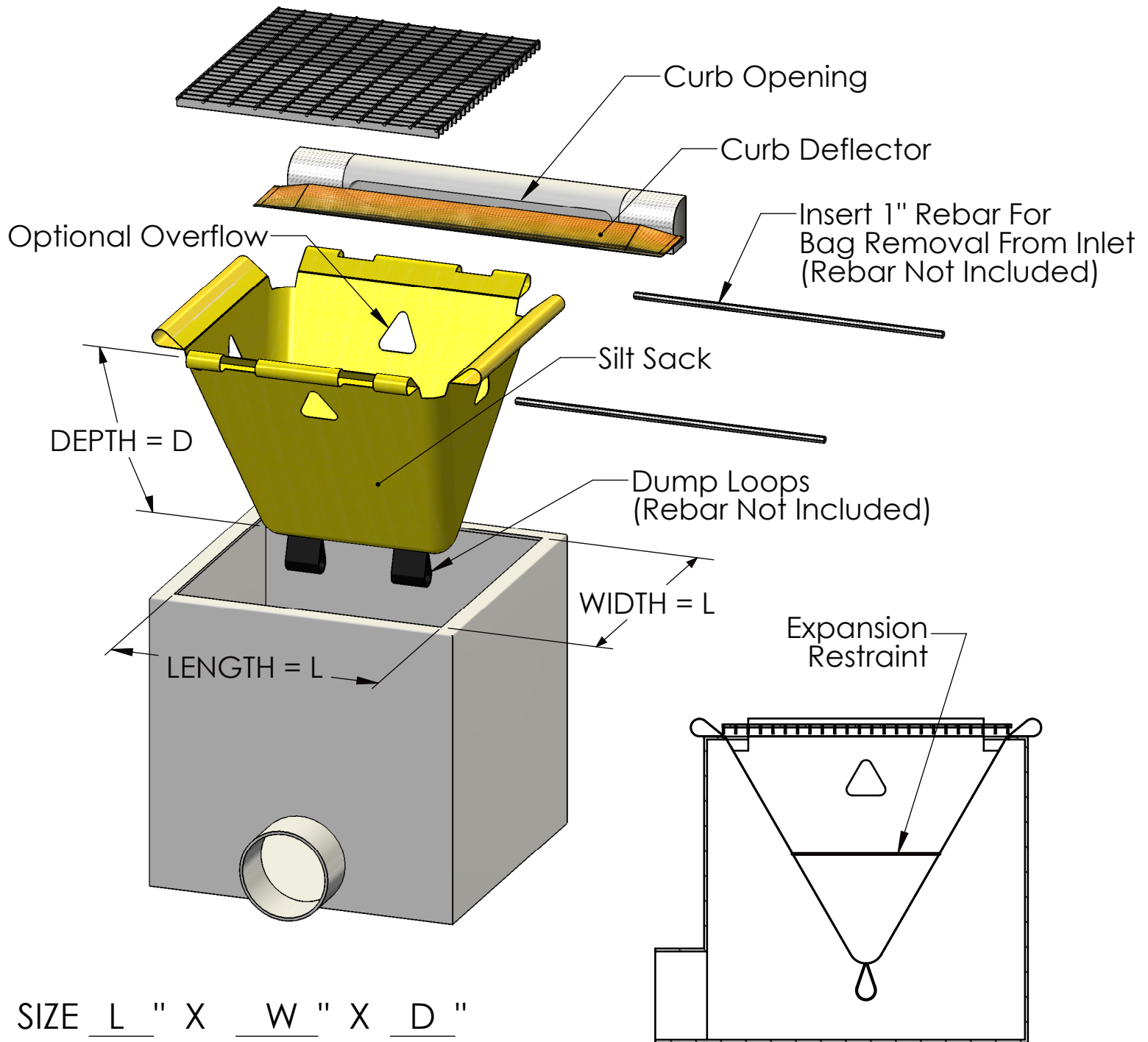
*** Revised April 14th, 2017**

Note: This information is provided as reference only and is not intended as a warranty or guarantee. ACF assumes no liability in connection with the use of this information (4/14/2017).

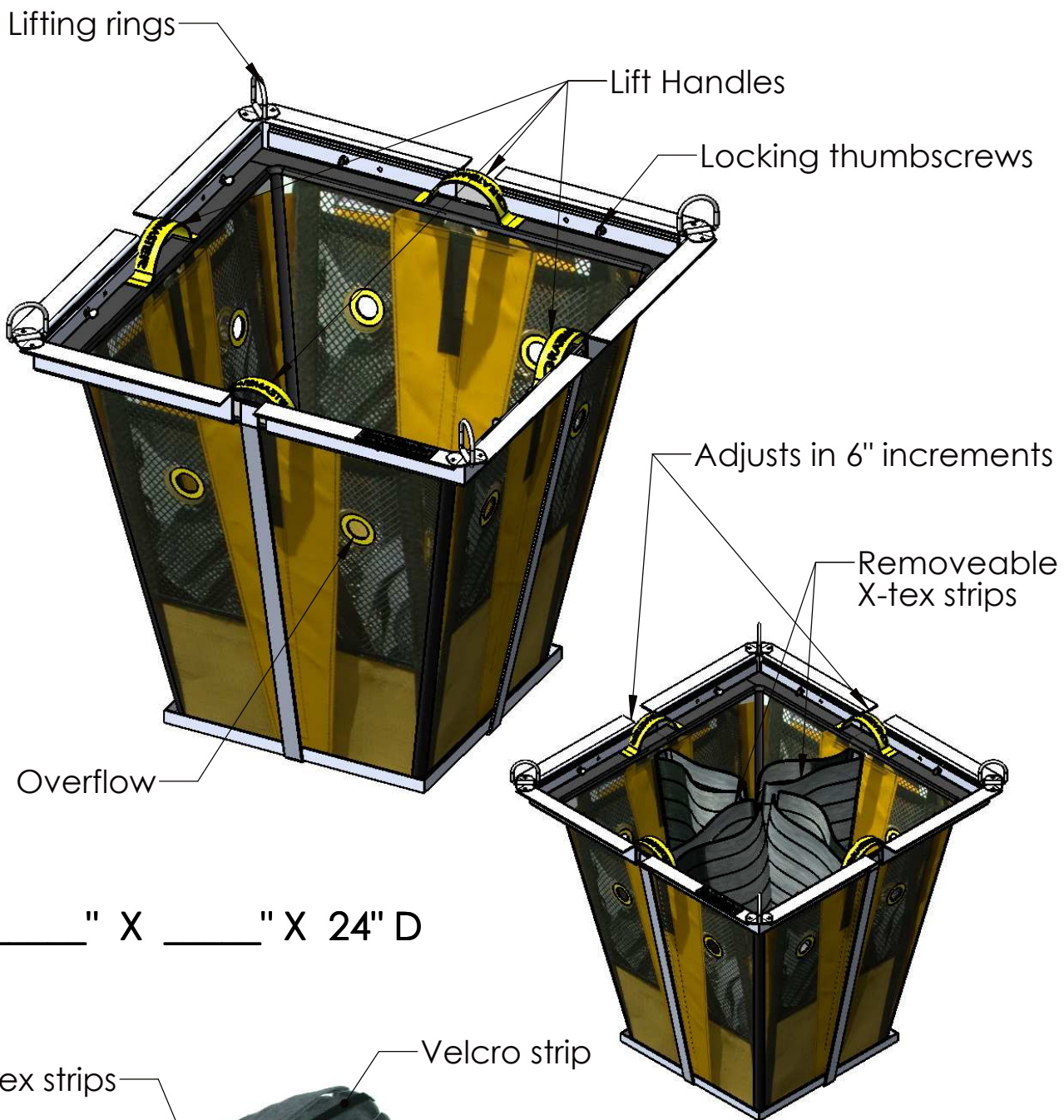
Silt Sack - Type A



Silt Sack - Type B

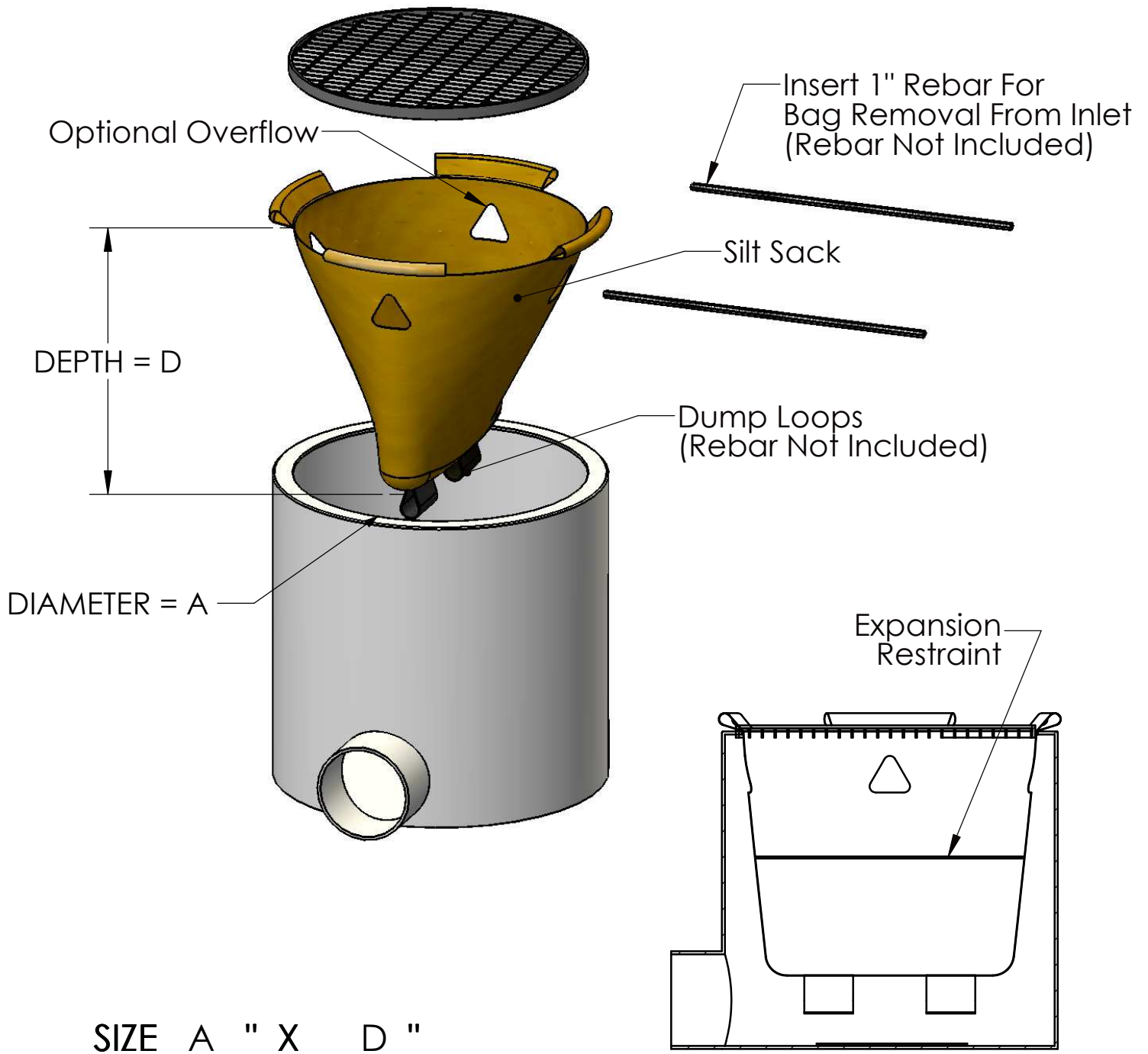


GrateMaster - Type C

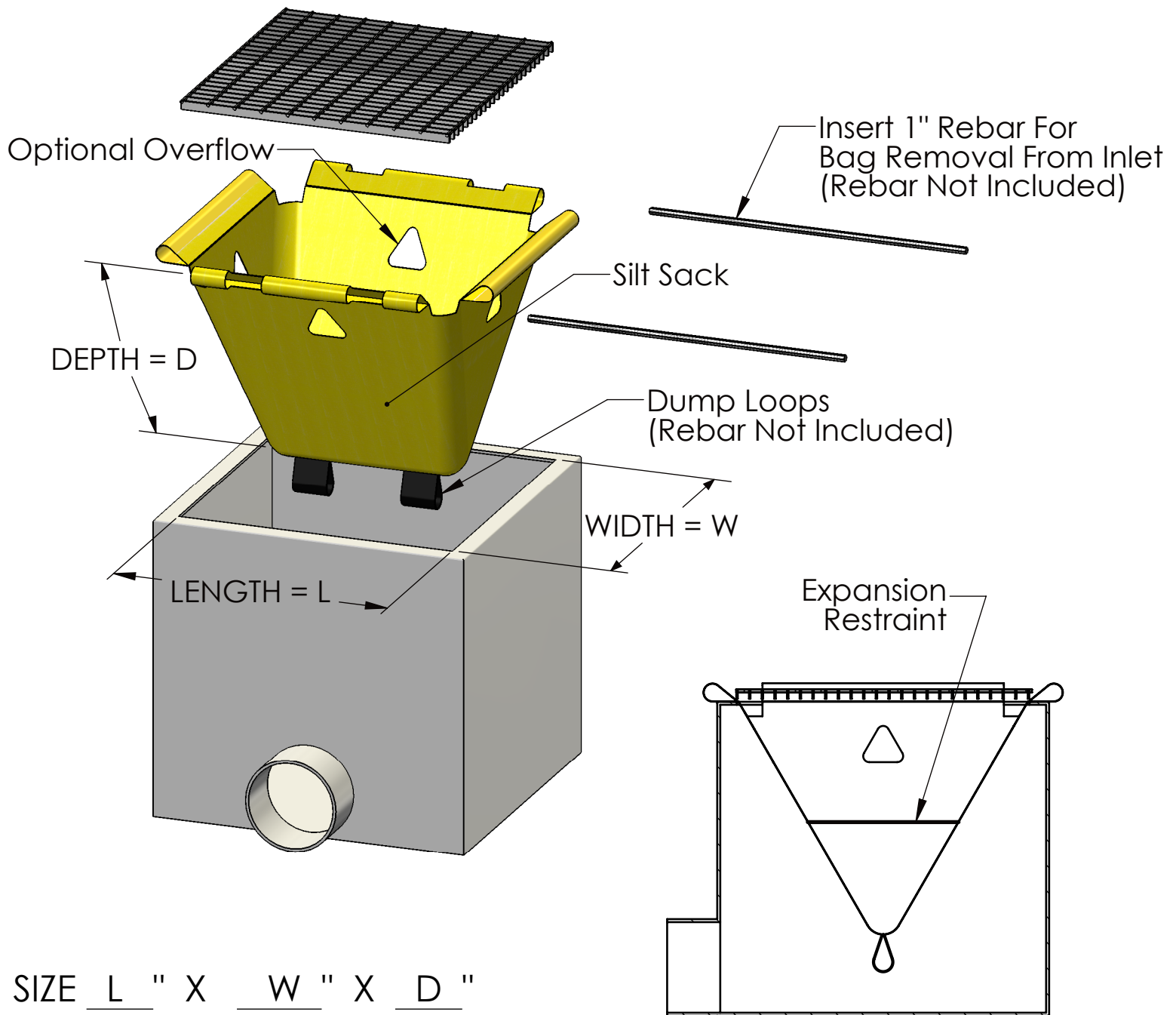


2831 Cardwell Road
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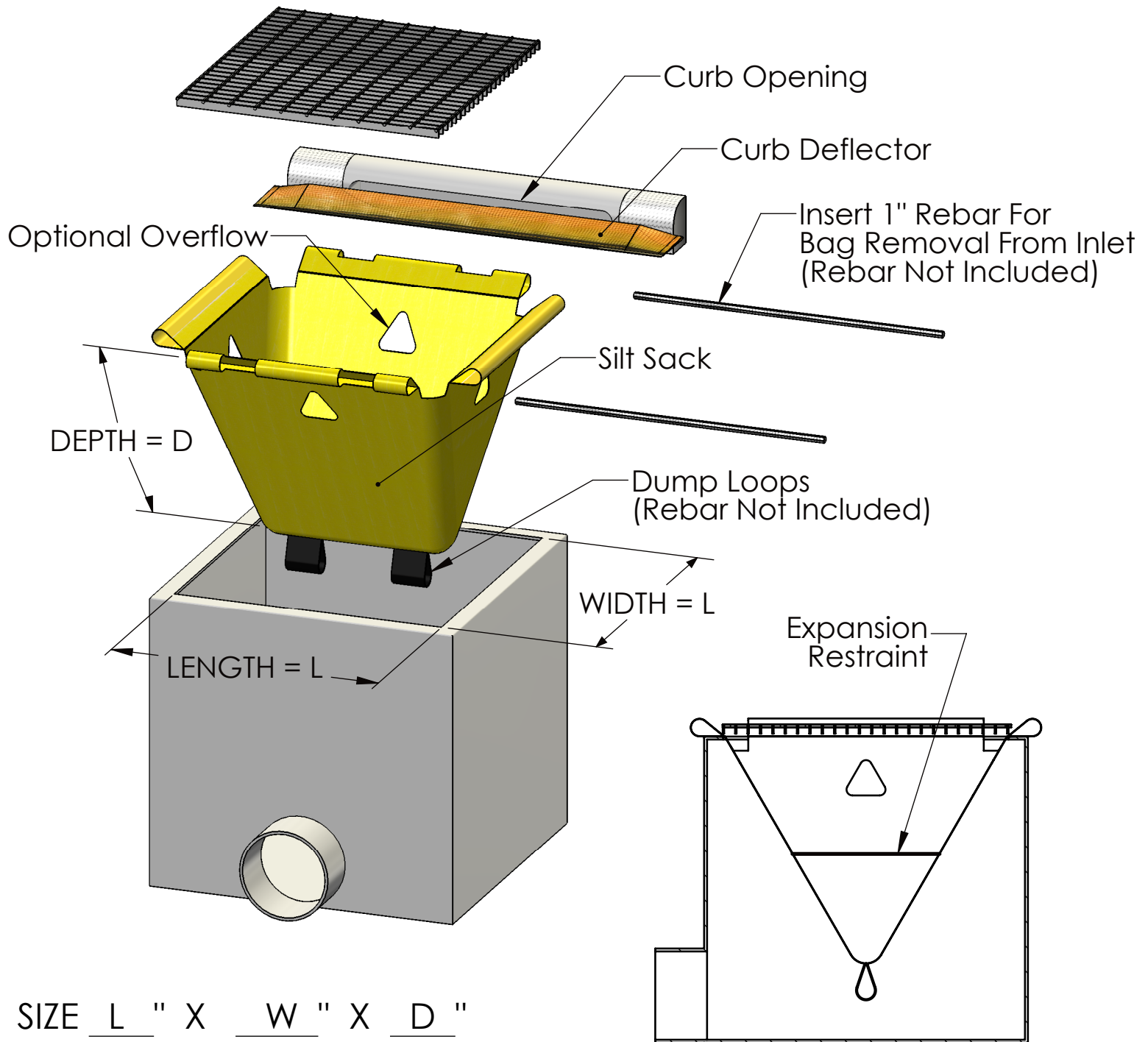
Silt Sack - ROUND



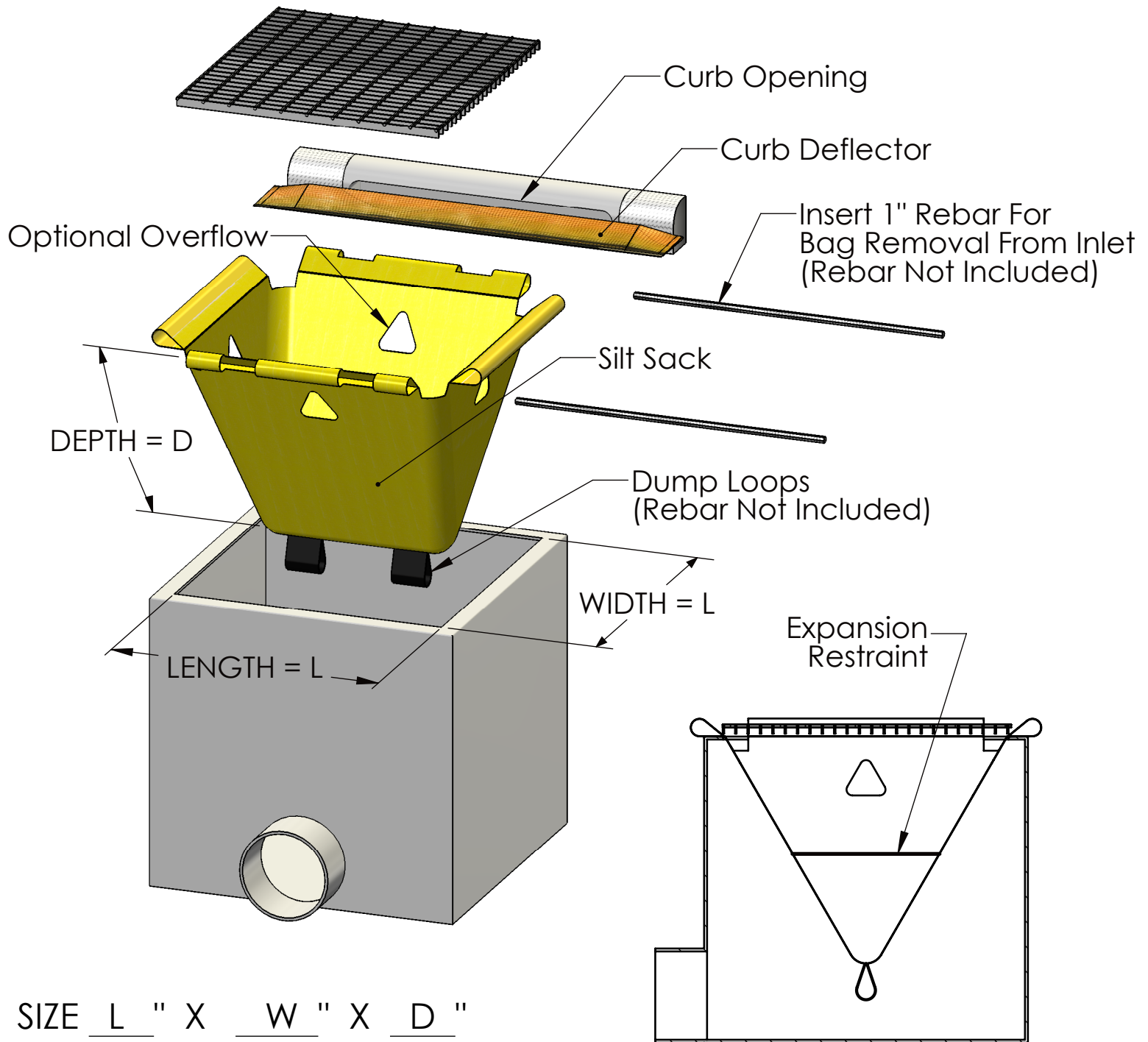
Silt Sack - Type A



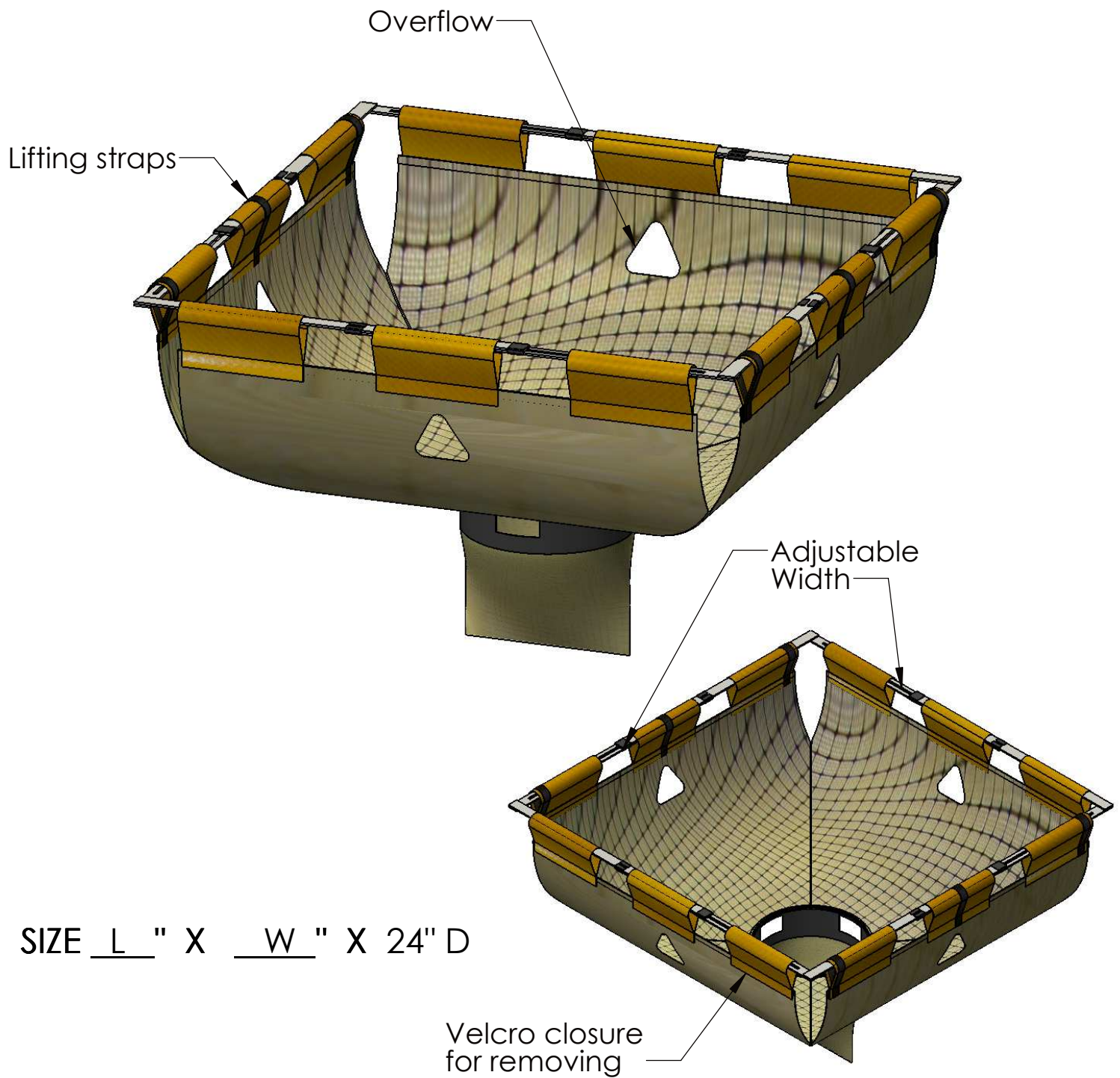
Silt Sack - Type B



Silt Sack - Type B

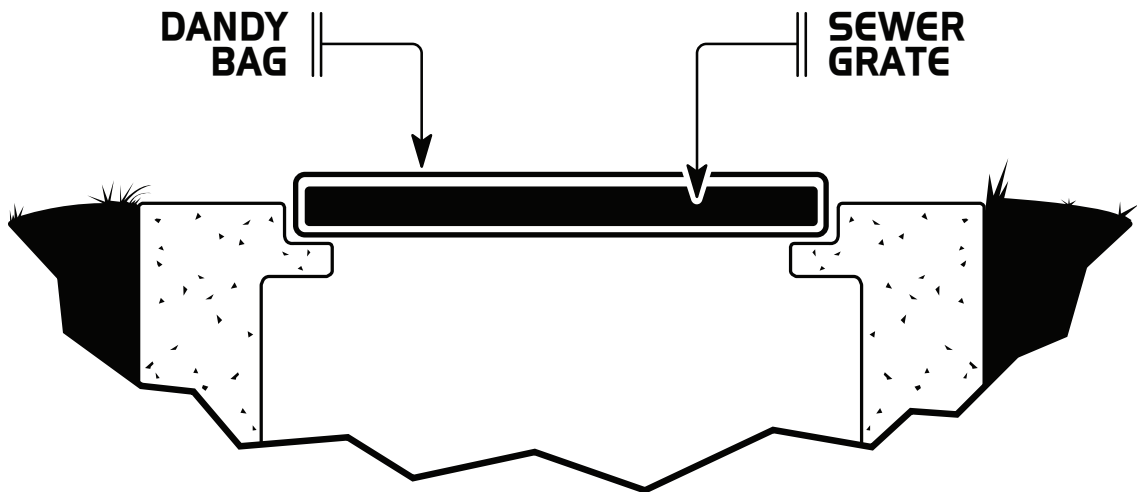
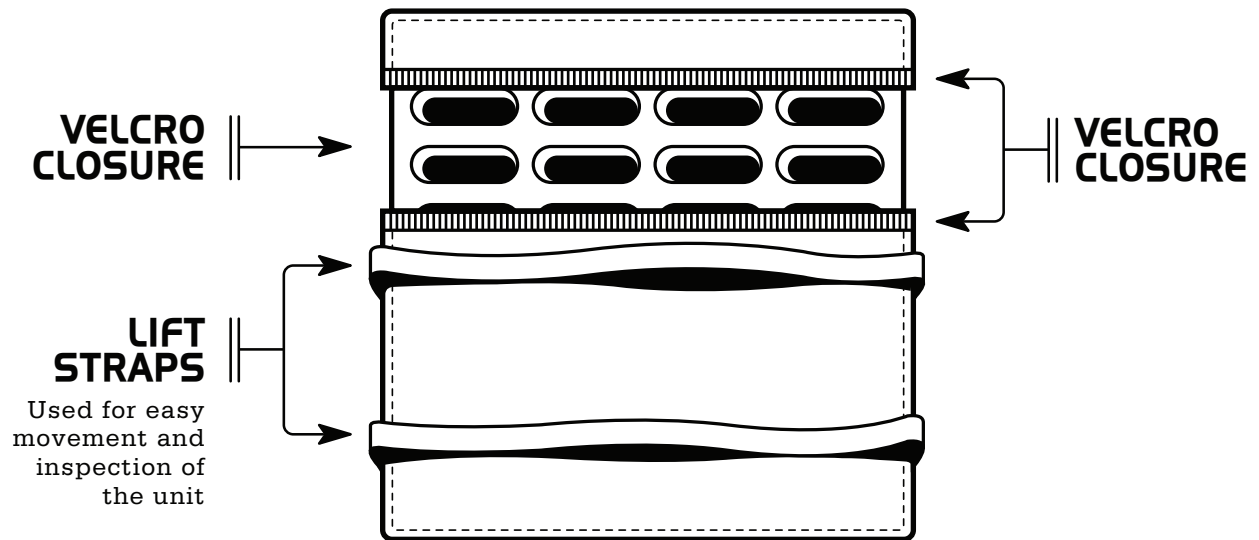


Silt Sack - Type C



2831 Cardwell Road
Richmond, VA 23234
WWW.ACFENVIRONMENTAL.COM

DANDY BAG®



DANDY BAG®

INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY BAG®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Description:

1.1 Work covered under this item consists of installing a Dandy Bag® inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 Material:

2.1 The Dandy Bag® inlet protection unit shall be a **sewn in the U.S.A.** geotextile fabric unit fitted to the individual grate(s) and completely enclosing the grate(s).

2.2 The Dandy Bag® shall have lifting devices to allow manual inspection of the storm water system.

2.3 The Dandy Bag® unit shall utilize an orange monofilament fabric manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 X 300
Elongation	ASTM D 4632	%	40% X 25%
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec ¹	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft ²	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange ¹

¹The color orange is a trademark of Dandy Products, Inc.

The property values listed above are effective October 2010 and are subject to change without notice.

3.0 Installation:

- 3.1 Place the empty Dandy Bag® over the grate as the grate stands on end.
- 3.2 *For oil and sediment model; to install or replace absorbent, place absorbent pillow in pouch, on the bottom (below-grade side) of the unit.*
- 3.3 Tuck the enclosure flap inside to completely enclose the grate.
- 3.4 Holding the lifting devices, insert the grate into the inlet being careful not to damage the Dandy Bag® unit.

4.0 Maintenance:

- 4.1 The contractor shall remove all accumulated sediment and debris from surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.
- 4.2 *For oil and sediment model; remove and replace absorbent when near saturation.*

5.0 Method of Measurement:

- 5.1 The quantity to be paid is for the actual number of Dandy Bag® inlet protection units installed

6.0 Basis of Payment:

- 6.1 The unit price shall include labor, equipment, and materials necessary to complete the work and maintain the Dandy Bag® inlet protection units.
- 6.2 Payment for the completed work will be made at the contract prices for:

<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Dandy Bag®	EA	Inlet Protection Unit (# _____ Inlet)

DANDY CURB®
GRATELESS CURB INLET AND MEDIAN BARRIER INLET
PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY CURB®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Description:

1.1 Work covered under this item consists of installing a Dandy Curb® inlet protection system for inlets and median barrier inlets without grates. The purpose is to keep silt, sediment and construction debris out of the storm system.

2.0 Material:

2.1 The Dandy Curb® inlet protection system shall be a **sewn in the U.S.A.** fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides.

2.2 The Dandy Curb® inlet protection system shall have a pouch on the street side of the sewn unit for aggregate or other material to hold the unit in place.

2.3 The Dandy Curb® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec ¹	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft ²	250
Ultraviolet Resistance	ASTM D 4355	%	70

Color			Orange ¹
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¹The color orange is a trademark of Dandy Products, Inc.

The property values listed above are effective October 2010 and are subject to change without notice.

3.0 Installation:

3.1 Place Dandy Curb® inlet protection unit on ground with aggregate pouch on street side near inlet it will be installed on.

3.2 *For oil and sediment model, to install or replace absorbent, place absorbent sock in pouch.*

3.3 Fill pouch with aggregate such as #5-7, 8's or similar to a level (at least ½ full) that will keep unit in place during a rain event and create a seal between the Dandy Curb® and the surface of the street. Reseal Velcro access.

3.4 Center the unit against curb or median inlet opening so that the curb side of the unit creates a seal with the curb or median barrier and inlet structure. There will be approximately twelve (12) inches of the inlet protection unit overhanging on each side of the opening. If the unit is not installed in this manner, it will not function properly.

4.0 Maintenance:

4.1 The contractor shall remove all accumulated sediment and debris from surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.

4.2 *For oil and sediment model; remove and replace absorbent when near saturation.*

5.0 Method of Measurement:

5.1 The quantity to be paid is for the actual number of Dandy Curb® inlet protection units installed.

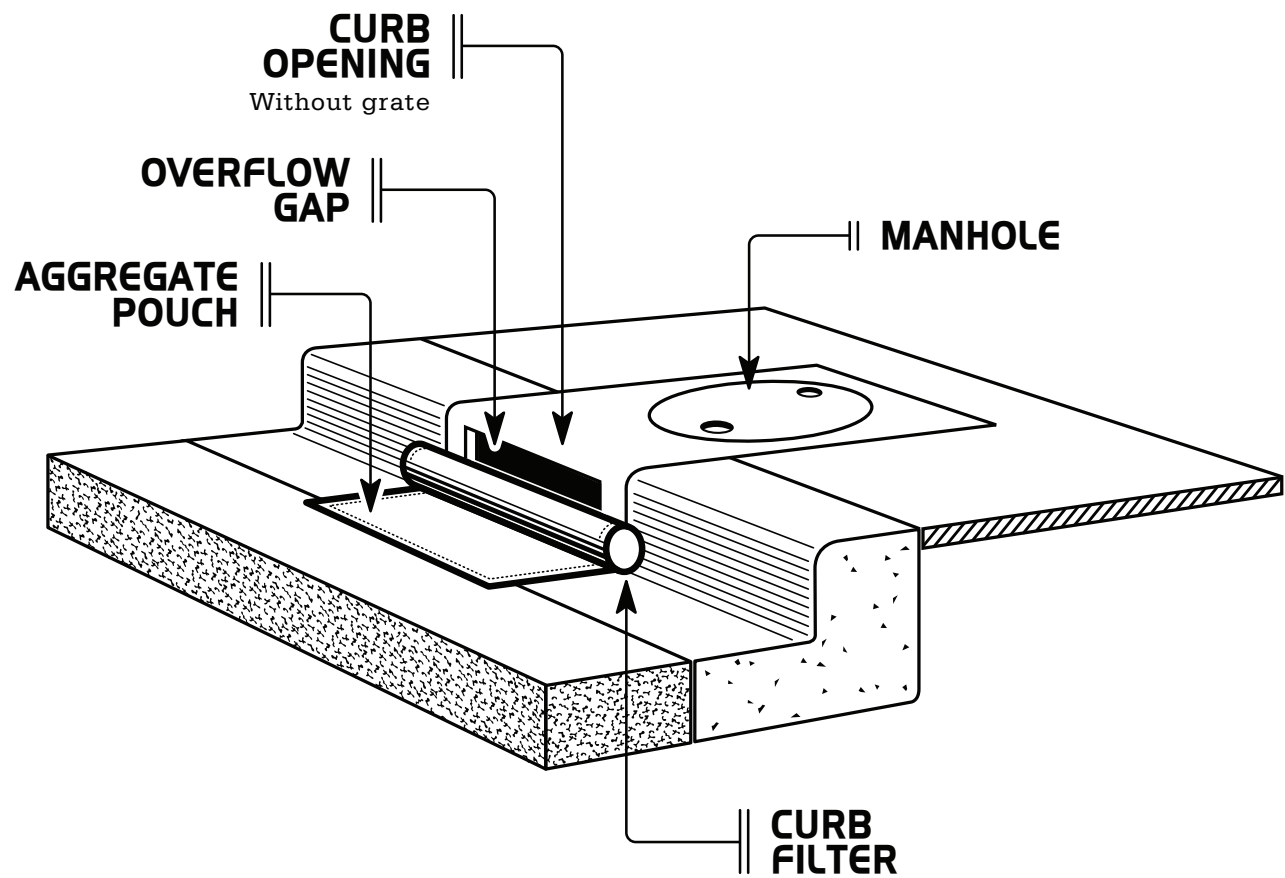
6.0 Basis of payment:

6.1 The unit price shall include labor, equipment, and materials necessary to complete the work and maintain the True Dam® inlet protection units.

6.2 Payment for the completed work will be made at the contract prices for:

<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Dandy Curb®	EA	Inlet Protection Unit (#_____Inlet)

► **DANDY CURB™** ◀



DANDY CURB BAG® CURB AND GUTTER INLET/GRATE PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY CURB BAG®

MANUFACTURER:

Dandy Products, Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E-mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Description:

- 1.1 Work covered under this item consists of installing a Dandy Curb Bag® curb and gutter inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 Material:

- 2.1 The Dandy Curb Bag® curb and gutter inlet protection unit shall be a **sewn in the U.S.A.** geotextile fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides and have a geotextile fabric envelope fitted to the individual grate(s) on the street side of the sewn unit for grate(s) to be inserted and to completely enclose the grate(s).
- 2.2 The Dandy Curb Bag® shall have lifting devices to allow manual inspection of the storm water system.
- 2.3 The Dandy Curb Bag® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec ¹	3.5

Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft ²	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange ¹

¹The color orange is a trademark of Dandy Products, Inc.

The property values listed above are effective October 2010 and are subject to change without notice.

3.0 Installation:

3.1 Place the empty Dandy Curb Bag® unit over the grate as the grate stands on end.

3.2 *For oil and sediment model; to install or replace absorbent, place absorbent pillow in pouch, on the bottom (below-grade side) of the unit.*

3.3 Tuck the enclosure flap inside to completely enclose the grate.

3.4 Holding the lifting devices, being careful not to damage the sewn fabric unit, insert the grate into its frame, street side edge first, then lower back edge with cylindrical tube into place. The cylindrical tube should be partially blocking the curb hood opening when installed properly.

4.0 Maintenance:

4.1 The contractor shall remove all accumulated sediment and debris from surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.

4.2 *For oil and sediment model; remove and replace absorbent when near saturation.*

5.0 Method of Measurement:

5.1 The quantity to be paid is for the actual number of Dandy Curb Bag® inlet protection units installed

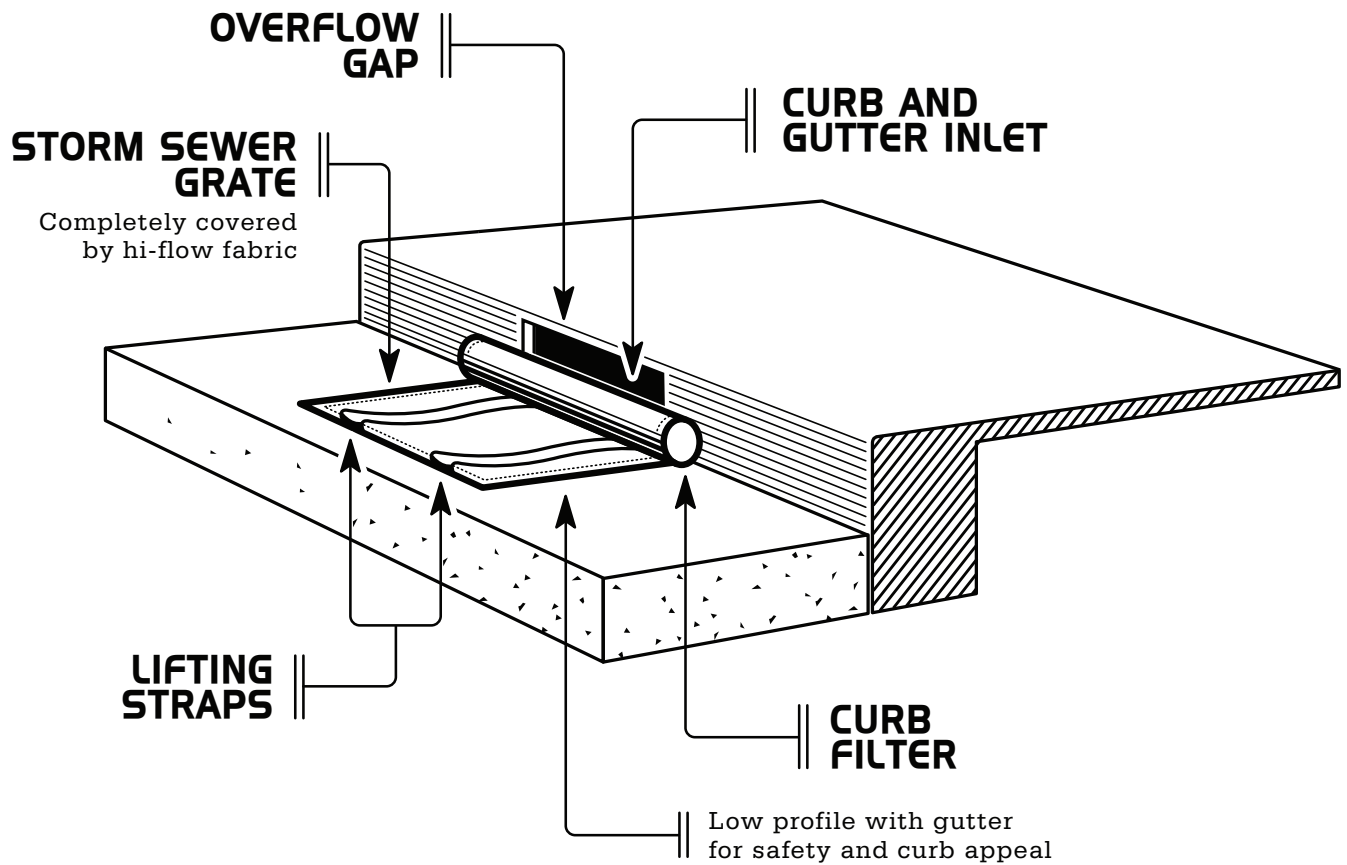
6.0 Basis of payment:

6.1 The unit price shall include labor, equipment, and materials necessary to complete the work and maintain the Dandy Curb Bag® inlet protection units.

6.2 Payment for the completed work will be made at the contract prices for:

<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Dandy Curb Bag®	EA	Curb Inlet Protection Unit (#_____Inlet)

➤ **DANDY CURB BAG™** ◀



DANDY CURB SACK® CURB AND GUTTER INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY CURB SACK®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Description:

1.1 Work covered under this item consists of installing a Dandy Curb Sack® curb and gutter inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 Material:

2.1 The Dandy Curb Sack® curb and gutter inlet protection unit shall be a sewn geotextile fabric unit **made in the U.S.A.** enclosing a porous structure in the form of a cylindrical tub placed in front and extending beyond the inlet opening on both sides and have a geotextile fabric sack attached designed to fit the opening of the catch basin or drop inlet and to hang underneath the grate and into the catch basin.

2.2 The Dandy Curb Sack® shall have lifting straps to allow removal of the unit and manual inspection of the storm water system.

2.3 The Dandy Curb Sack® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec ¹	3.5
Permeability	ASTM 4491	cm/sec	0.25

Water Flow Rate	ASTM 4491	gal/min/ft ²	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange ¹

¹The color orange is a trademark of Dandy Products, Inc.

The property values listed above are effective October 2010 and are subject to change without notice.

3.0 Installation:

3.1 Remove the grate from the catch basin.

3.2 *For Oil and Sediment Model; to install or replace absorbent, place absorbent pillow in unit, on the bottom (below-grade side) of the unit.*

3.3 Stand the grate on end. Move the top lifting straps out of the way and place the grate into the Dandy Curb Sack® unit so that the grate is below the top straps and above the lower straps. The grate should be cradled between the upper and lower straps.

3.4 Holding the lifting devices, insert the grate into the inlet, then lower back edge with cylindrical tube into place, being careful that the grate remains in place and being careful not to damage the Dandy Curb Sack® unit. The cylindrical tube should partially block the curb hood opening when installed properly.

4.0 Maintenance:

4.1 Remove all accumulated sediment and debris from vicinity of unit after each storm event.

4.2 After each storm event and at regular intervals, look into the Dandy Curb Sack® unit. If the unit is more than 1/3 full of accumulated sediment, the unit must be emptied.

4.3 To empty the unit, using the lifting straps lift the unit out of the inlet and remove the grate. Transport the unit to an appropriate location for removal of the contents. Holding the dumping straps on the outside at the bottom of the unit, turn the unit upside down, emptying the contents. Reinstall unit as above.

4.4 *For Oil and Sediment Model; remove and replace absorbent when near saturation.*

4.5 Dispose of unit and/or absorbent in accord with applicable Federal, state and local environmental laws and regulations.

5.0 Method of Measurement:

5.1 The quantity to be paid is for the actual number of Dandy Curb Sack® inlet protection units installed

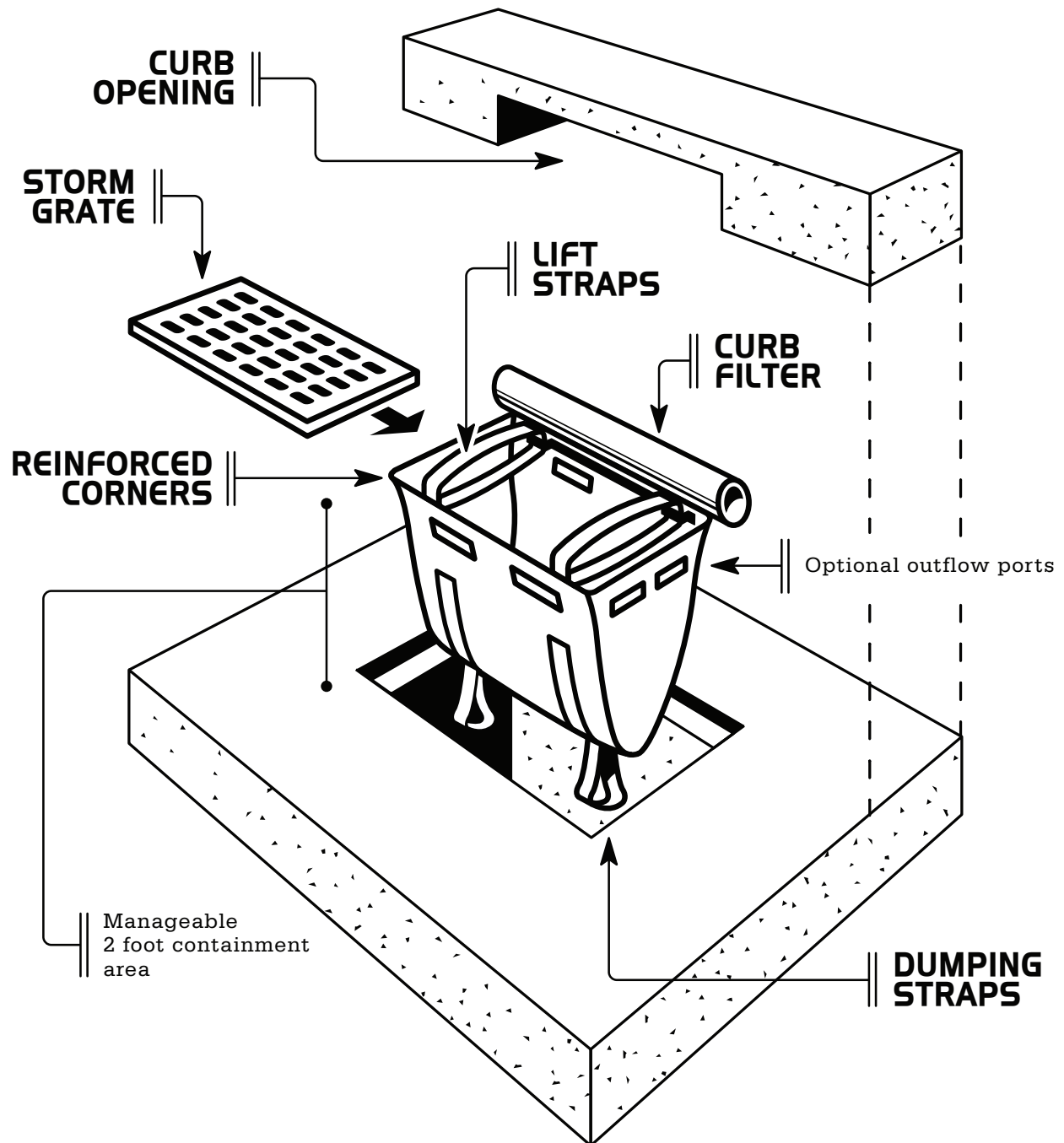
6.0 Basis of payment:

6.1 The unit price shall include labor, equipment, and materials necessary to complete the work and maintain the Dandy Curb Sack® inlet protection units.

6.2 Payment for the completed work will be made at the contract prices for:

<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Dandy Curb Sack®	EA	Inlet Protection Unit (#_____Inlet)

► DANDY CURB SACK™ ◀



DANDY POP[®] (POP-UP DANDY BAG[®]) INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT: DANDY POP[®]

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Description:

- 1.1 Work covered under this item consists of installing a Dandy Pop[®] inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 Material:

- 2.1 The Dandy Pop[®] inlet protection unit shall be a **sewn in the U.S.A.** geotextile fabric dome unit with a fully-covered support frame. The unit shall enclose the grate.
- 2.2 The Dandy Pop[®] shall unfold for installation to a height of approximately 24" (twenty-four inches).
- 2.3 The Dandy Pop[®] shall have lifting devises sewn to the bottom of the unit to assist in installation and to allow manual inspection of the storm water system.
- 2.4 The Dandy Pop[®] shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec ¹	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft ²	250

Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange ¹

¹The color orange is a trademark of Dandy Products, Inc.

The property values listed above are effective October 2010 and are subject to change without notice.

3.0 **Installation:**

- 3.1 Pop open the Dandy Pop[®] near the inlet.
- 3.2 Stand the grate on end and slide the Dandy Pop[®] over the grate.
- 3.3 For oil and sediment model; to install or replace absorbent, place absorbent pillow in pouch, on the bottom (below-grade side) of the unit. As desired, or required, attach absorbent pillow to provided tether loop.
- 3.4 Turn the grate 180° on end (turn twice) so that the opening is facing up.
- 3.5 Pull up slack and seal velcro[®] to enclose the grate.
- 3.6 Lay the grate flat, and holding the lifting devices, insert the grate into the inlet making sure that the grate seats completely in the frame.

4.0 **Maintenance:**

- 4.1 The contractor shall remove all accumulated sediment and debris from panels and surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.
- 4.2 *For oil and sediment model; remove and replace absorbent when near saturation.*

5.0 **Method of Measurement:**

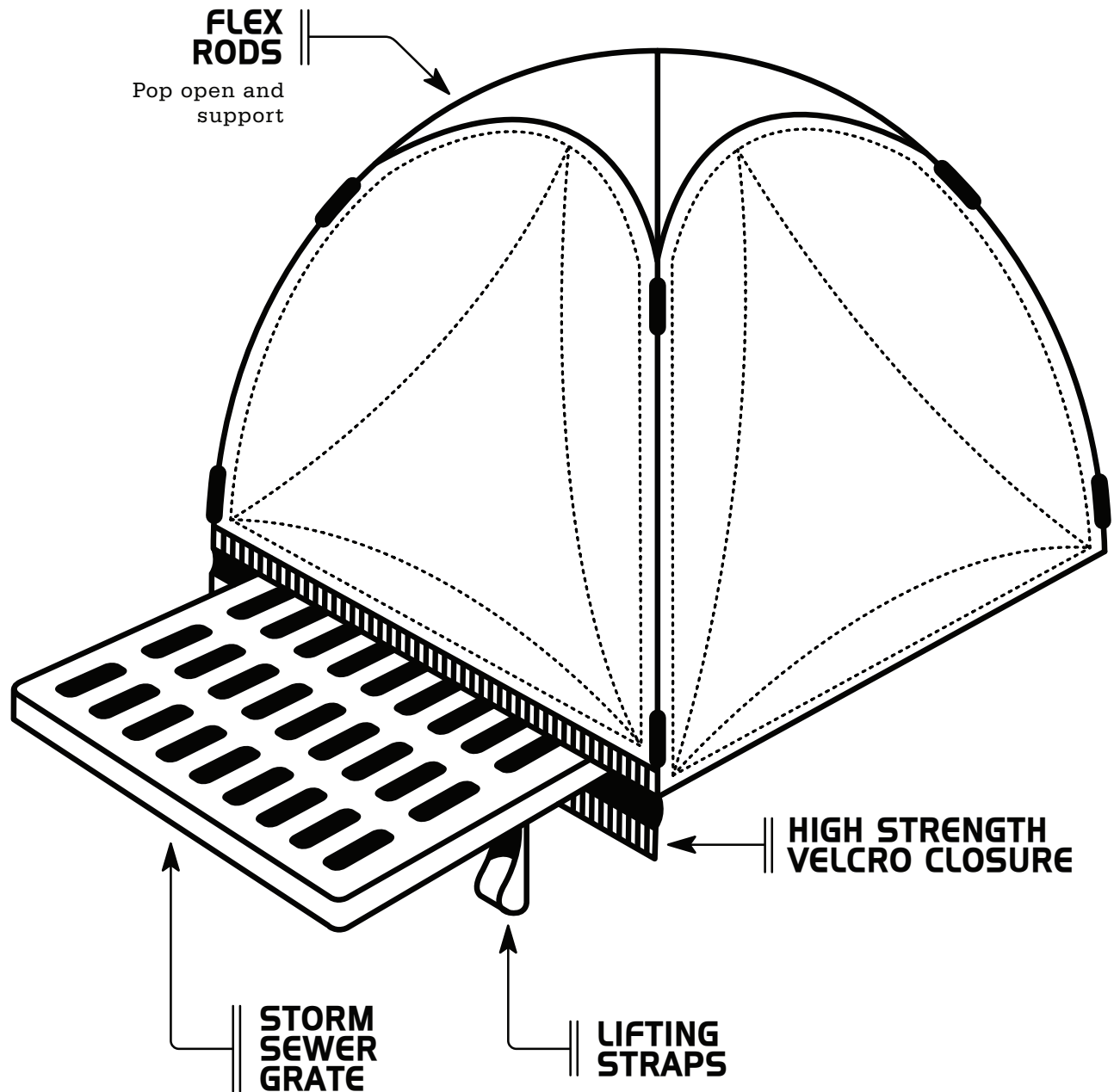
- 5.1 The quantity to be paid is for the actual number of Dandy Pop[®] inlet protection units installed

6.0 **Basis of payment:**

- 6.1 The unit price shall include labor, equipment, and materials necessary to complete the work and maintain the Dandy Pop[®] inlet protection units.
- 6.2 Payment for the completed work will be made at the contract prices for:

<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Dandy Pop [®]	EA	Inlet Protection Units (#_____INLET)

DANDY POP™



DANDY SACK®

INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY SACK®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Description:

1.1 Work covered under this item consists of installing a Dandy Sack® inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 Material:

2.1 The Dandy Sack® inlet protection unit shall be a **sewn in the U.S.A.** geotextile fabric unit.

2.2 The Dandy Sack® shall have lifting straps to allow removal of the unit and manual inspection of the storm water system.

2.3 The Dandy Sack® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec ¹	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft ²	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange ¹

¹The color orange is a trademark of Dandy Products, Inc.

The property values listed above are effective October 2010 and are subject to change without notice.

3.0 Installation:

3.1 Remove the grate from the catch basin.

3.2 *For Oil and Sediment Model; to install or replace absorbent, place absorbent pillow in unit, on the bottom (below-grade side) of the unit.*

3.3 Stand the grate on end. Move the top lifting straps out of the way and place the grate into the Dandy Sack® unit so that the grate is below the top straps and above the lower straps. The grate should be cradled between the upper and lower straps.

3.4 Holding the lifting devices, insert the grate into the inlet, being careful that the grate remains in place and being careful not to damage the Dandy Sack® unit.

4.0 Maintenance:

4.1 Remove all accumulated sediment and debris from vicinity of unit after each storm event.

4.2 After each storm event and at regular intervals, look into the Dandy Sack® unit. If the unit is more than 1/3 full of accumulated sediment, the unit must be emptied.

4.3 To empty the unit, using the lifting straps lift the unit out of the inlet and remove the grate. Transport the unit to an appropriate location for removal of the contents. Holding the dumping straps on the outside at the bottom of the unit, turn the unit upside down, emptying the contents. Reinstall unit as above.

4.4 *For Oil and Sediment Model; remove and replace absorbent when near saturation.*

4.5 Dispose of unit and/or absorbent in accord with applicable Federal, state and local environmental laws and regulations.

5.0 Method of Measurement:

5.1 The quantity to be paid is for the actual number of Dandy Sack® inlet protection units installed

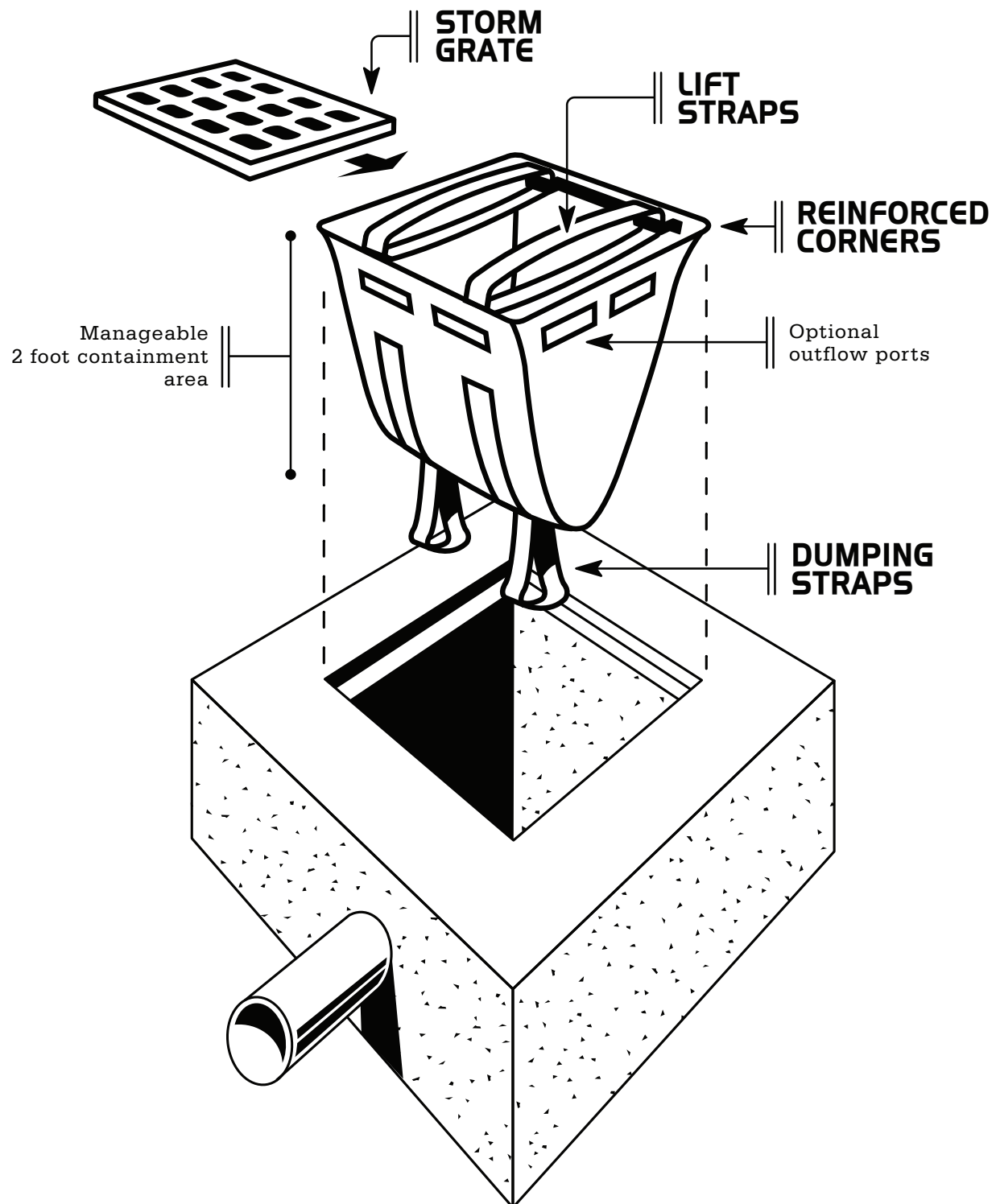
6.0 Basis of Payment:

6.1 The unit price shall include labor, equipment, and materials necessary to complete the work and maintain the Dandy Sack® inlet protection units.

6.2 Payment for the completed work will be made at the contract prices for:

<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Dandy Sack®	EA	Inlet Protection

► **DANDY SACK™** ◀





Rapid Flow Curb Drain Filters are a flexible tube containing light weight, plastic rocks encapsulated in a high strength knitted fabric. Rapid Flow Curb Drain Filters are manufactured to meet the following specifications:

Rapid Flow Curb Filters

Rapid Flow Inlet Protection

Specifications for Polystyrene Aggregate:

Density:	.40 to .65 lbs/cubic ft ³
Bulk Dry Specific Gravity:	.025
Void Space:	50%
Flow Rate:	3.53 GPM PS Bead
Load Deformation @ 2 psi:	.0365 in
Load Deformation @ 4 psi:	.948

Specifications for Outer Shell:

Weight:	7.8 oz. / yd ²	ASTM D-3776
Color:	Black	
Tensile Strength:	Warp: 125lbs. Fill: 313lbs.	ASTM-1682
Elongation:	Warp: 90.4% Fill: 75.6%	ASTM D-3786
Puncture:	87lbs.	
Tear:	Warp: 49lbs. Fill: 114lbs.	ASTM D-2261
Burst:	420psi	ASTM D-3786
UV Inhibitor:	2% Carbon Black	

DANDY DEWATERING BAG TM

PUMPED WATER SEDIMENT CONTROL SYSTEM GUIDE

SPECIFICATIONS

PRODUCT:

DANDY DEWATERING BAGTM

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E Mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Description:

- 1.1 Work covered under this consists of furnishing, installing, maintaining, and removal of the Dandy Dewatering Bag TM. The purpose is to control sediment discharge in any dewatering or pumped water application.

2.0 Material:

- 2.1 The Dandy Dewatering BagTM shall be a bag sewn of nonwoven fabric **in the U.S.A.** using a double needle machine and a high strength thread.
- 2.2 The Dandy Dewatering BagTM shall have a spout opening large enough to accommodate at least a four (4) inch pump discharge hose with an attached strap to tie unit closed.
- 2.3 The Dandy Dewatering BagTM Seams shall be a double stitched “J” type seam with an average wide width strength per ASTM D-4884 of 60lb/in for a 8 oz. fabric manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	MARV
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.9 (205)
Grab Tensile Elongation	ASTM D 4632	%	50
Puncture Strength	ASTM D 4833	kN (lbs)	0.58 (130)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2618 (380)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.36 (80)
% Open Area	COE - 22125-86	%	N/A
Apparent Opening Size	ASTM D 4751	mm (US Std Sieve)	.0180 (80)

Permittivity	ASTM D 4491	sec ¹	1.2
Permeability	ASTM 4491	cm/sec	0.21
Water Flow Rate	ASTM 4491	l/min/m ² (gal/min/ft ²)	3866 (95)
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Black

3.0 Installation:

- 3.1 Lifting straps (not included) should be placed under the unit to facilitate removal after use.
- 3.2 Unfold Dandy Dewatering Bag™ on a stabilized area over dense vegetation, straw, or gravel (if an increased drainage surface is needed) or as detailed in plans.
- 3.3 Insert discharge hose from pump into Dandy Dewatering Bag™ a minimum of six (6) inches and tightly secure with attached strap to prevent water from flowing out of the unit without being filtered.

4.0 Maintenance:

- 4.1 Replace the unit when ½ full of sediment or when sediment has reduced the flow rate of the pump discharge to an impractical rate.
- 4.2 Remove and dispose of the sediment in a manner satisfactory to the engineer/inspector or in one of the following ways:
 - A) Remove the unit and sediment from environmentally sensitive areas and waterways. At the approved disposal site, slit the unit; remove the sediment and grade smoothly into the existing topography. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.
 - B) Bury unit on site; remove any visible fabric and seed.

5.0 Method of Measurement:

- 5.1 The quantity to be paid is for the actual number of Dandy Dewatering Bags™.

6.0 Basis of Payment:

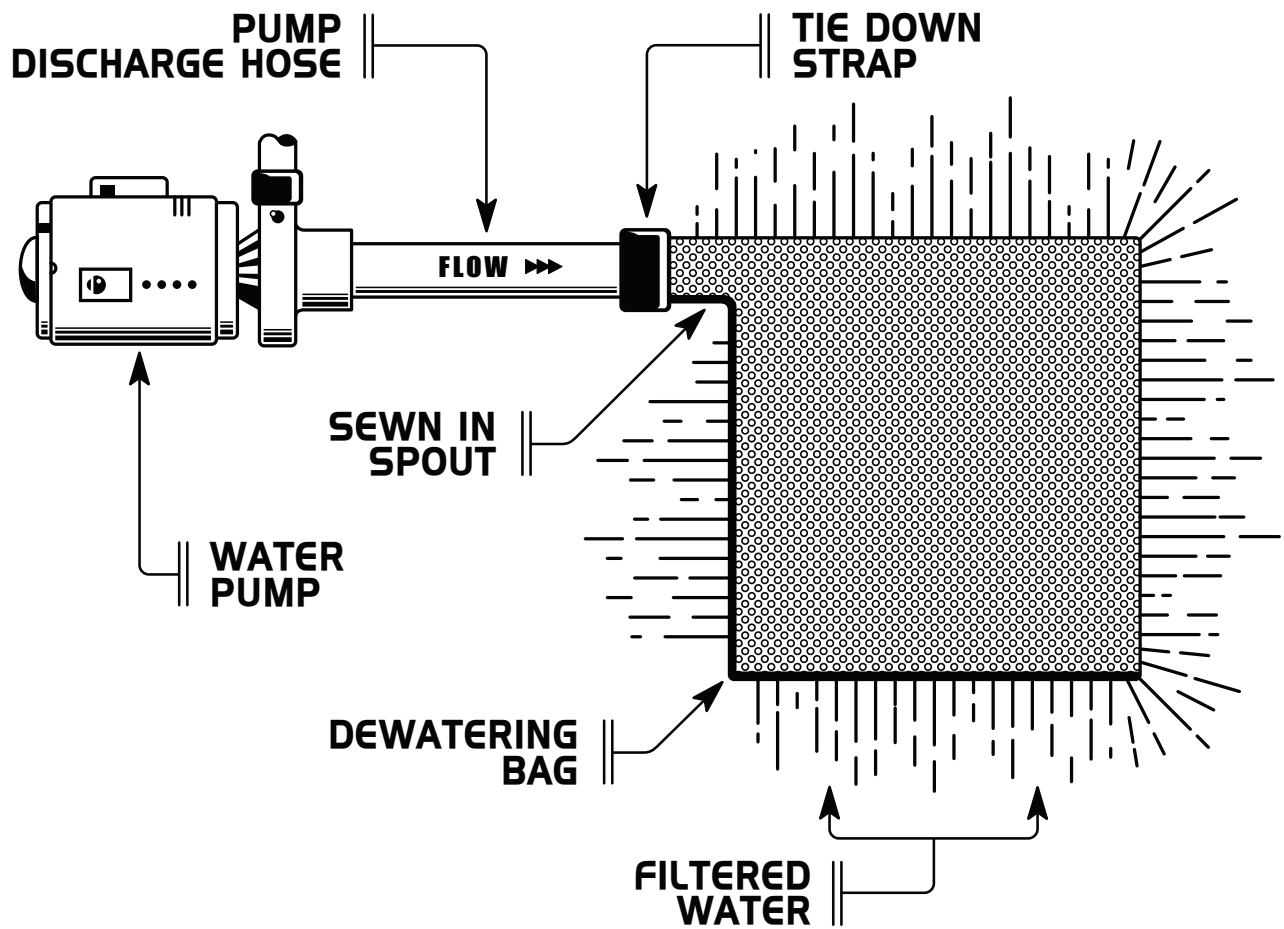
6.1 The unit price shall include labor, equipment, and materials necessary to install, maintain, and remove the Dandy Dewatering Bag™.

6.2 Payment for the completed work will be made at the contract prices for:

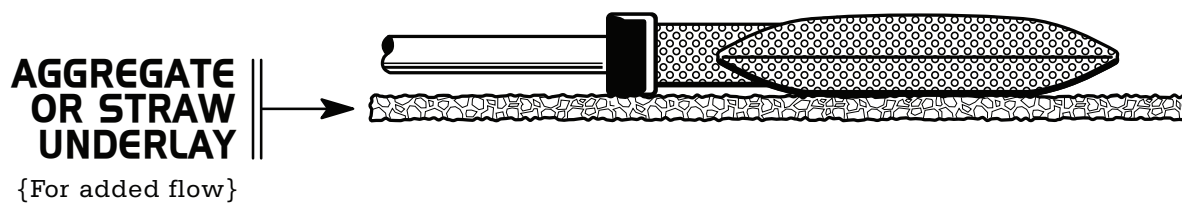
<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Dandy Dewatering Bag™	EA	Pumped Water Sediment Control Unit (#_____UNITS)

➤ **DANDY DEWATERING BAG™** ◀

_____ **TOP VIEW** _____



_____ **SIDE VIEW** _____



DIRTBAG®

TECH NOTE

BACKGROUND INFORMATION:

ACF Dirtbag® units are manufactured using non-woven or woven polypropylene fabric. The purpose of the ACF Dirtbag® is to collect sand, silt, and fines, from dewatering effluent stormwater that enters streams, surrounding property, and storm sewers. Over the last 25 years during which ACF has produced and sold Dirtbags, ACF has compiled a vast amount of test data from third party laboratories and field installations. The purpose of this technical document is to note and explain the various test methods and results related to the Dirtbag® product.

DEWATERING BAG TEST METHODS:

ASTM D-4751: Standard Test Method for Determining Apparent Opening Size of a Geotextile

ASTM D-4884: Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles

ASTM D-7880: Standard Test Method for Determining Flow Rate of Water and Suspended Solids Retention from a Closed Geosynthetic Bag

APPARENT OPENING SIZE:

The non-woven polypropylene fabric used to manufacture the Dirtbag® product has an AOS measured by U.S. Sieve of 80. This fabric has been tested by a third party lab under ASTM D-4751. A U.S. Sieve of 80 will filter out a 177 micron size particle. This is especially important in dewatering bags, because the efficiency of the Dirtbag® product increases when a sediment coating builds up on the inside walls of the bag after pumping has begun. The discharged water becomes visibly clear due to the smaller particles being retained by the sediment coating. Each project has a different set of variables such as particle size, discharge rate, duration of pumping, and other jobsite specifics that will change the performance of the bag accordingly.

SEAM STRENGTH:

The ACF Dirtbag® is produced by sewing two layers of geotextile fabric together to form a bag, so the strength of the seam that connects the two layers is a very essential characteristic. ACF has third party test data on that seam strength, shown in the table below.

**SUMMARY OF ASTM D-4884
(SEAM STRENGTH TESTING)**

Parameter:	MARV
Type of Seam:	J-SEAM
Maximum Load (lbs)	938
Maximum Strength (ppi)	118

It is important to note that each test result was deemed as a material failure, rather than stitch failure or thread pull out, which shows that the seam and thread used by ACF is an acceptable means of connection for Dirtbag® units.

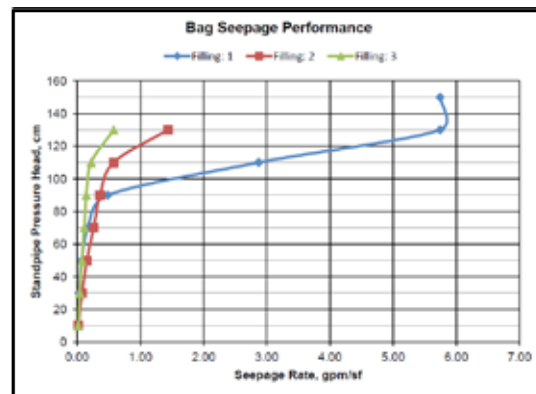
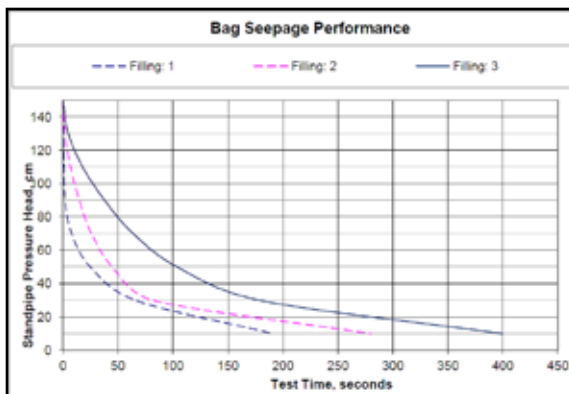
DIRTBAG® TECH NOTE

MANUFACTURED BAG TESTING (ASTM D-7880):

In addition to seam strength and AOS testing, our third party lab has also compiled results for the ACF Dirtbag® when tested as an actual manufactured bag. For this test, a geotextile bag was constructed to form a container that will expand when filled to accommodate a prescribed volume (in this case, 12 gallons) of water/soil slurry. The bag sits on a mesh platform and the slurry is introduced through an inlet standpipe causing the bag to expand into a pillow. Through multiple fillings, the relationship between head pressure and seepage time is established, along with associated flow rate and filtration efficiency. Tests conducted according to the above protocol produced the following results:

SUMMARY OF ASTM D-7880 RESULTS

Avg. Removal/Retention Efficiency (%)	Residual High-Head Flow Rate (gpm/sf)	Residual Low-Head Flow Rate (gpm/sj)
98.4	1.44	0.04



PICTURES FROM TEST SETUP



The results from this test prove the fact that the ACF Dirtbag® becomes more efficient once a sediment coating builds up on the inside walls of the Dirtbag®, while producing discharged water that is visibly clear due to the smaller particles being retained by the sediment coating.

CONCLUSION:

ACF feels that it is important to have the above mentioned test results done by a third party test laboratory in relation to the dewatering bag product. ACF strives to be a high quality manufacturer that goes above and beyond the required test results and information levied by regulatory agencies nationwide.

DIRTBAG

PUMPED SEDIMENT REMOVAL SYSTEM

SEDIMENT & PERIMETER CONTROL



Retains the silt, sand and fines while allowing the filtered water to drain out into the drainage system.

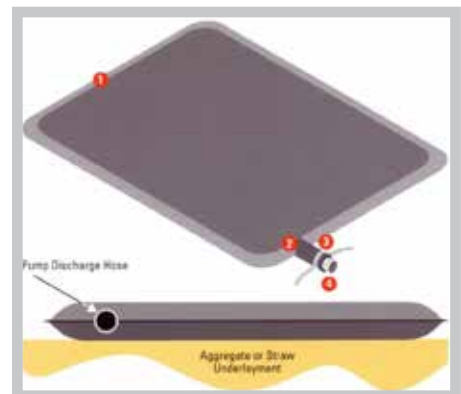
Protect the environment effectively and economically with the ACF Dirtbag®!

The ACF Dirtbag® collects sand, silt and fines, while regulating that enters streams, surrounding property and storm sewers. ACF can make custom Dirtbags® to suit your needs. ACF Environmental manufactures the Dirtbag® using a variety of woven and nonwoven geotextile fabrics. We can produce any size, dimension, or fabric weight requested.

Each standard Dirtbag® has a fill spout large enough to accommodate a 4" discharge hose. Straps are attached to secure the hose and prevent pumped water from escaping without being filtered. To increase the efficiency of filtration, place the bag on an aggregate or haybale bed to maximize water flow through the surface area of the bag. Dirtbag® is full when it no longer can efficiently filter sediment or pass water at a reasonable rate. Flow and removal rates will vary depending on the size of Dirtbag®, the type and amount of sediment discharged into Dirtbag®, the type of surface, rock or other substance under the bag. Under most circumstances Dirtbag® will accommodate flow rates of 500 gallons per minute. Use of excessive flow rates or overfilling Dirtbag® with sediment will cause ruptures of the bags or failure of the hose attachment straps.

Dirtbag® must be monitored during use.

Dirtbag® and Dirtbag® HD have been tested under ASTM D-7880 and ASTM D-7701, which are Standard Test Methods for Determining Flow Rate of Water and Suspended Solids Retention from a Closed Geosynthetic Bag. Testing summary available upon request.



DirtBag®

Standard Dirtbag® Features

- Higher flow rate
- Higher removal rate
- Smaller openings

Dirtbag®HD

NEW

Dirtbag®HD Features

- Higher strength
- More cost effective
- Less susceptible to ruptures

For more information about Sediment Perimeter Control, contact Inside Sales at 800.448.3636 or email at info@acfenv.com

WVWA ESC AS&S
Appendix 2 - Non-VESCH Measures



DIRTBAG® SPECIFICATIONS

LET'S GET IT DONE

STANDARD DIRTBAG®

Standard Sizes:

4' x 6'
5' x 5'
8' x 10'
10' x 10'
15' x 15'

Custom Sizes available upon request.

Geotextile Properties - 8oz: Nonwoven

Property	Test Method	Units	Test Results
Weight	ASTM D-3776	oz/yd	8
Grab Tensile	ASTM D-4632	lbs.	205
CBR Puncture	ASTM D-6241	lbs.	525
Flow Rate	ASTM D-4491	gal/min/ft ²	90
Permittivity	ASTM D-4491	sec. ⁻¹	1.4
UV Resistant	ASTM D-4355	%	70
AOS %	ASTM D-4751	US Sieve	80

DIRTBAG®HD

Standard Sizes:

3' x 5'
4' x 10'
6' x 20'
12' x 12.5'
12' x 18.75'

Custom Sizes available upon request.

Geotextile Properties - Woven

Property	Test Method	Units	Test Results
Weight	ASTM D-3776	oz/yd	6.13
Grab Tensile	ASTM D-4632	lbs.	168x300
CBR Puncture	ASTM D-6241	lbs.	901
Flow Rate	ASTM D-4491	gal/min/ft ²	66.2
Permittivity	ASTM D-4491	sec. ⁻¹	0.862
UV Resistant	ASTM D-4355	%	96
AOS %	ASTM D-4751	US Sieve	30

Dirtbag® Test Results

Property	Test Method	Units	Standard Dirtbag Results	Results
Average Removal Efficiency	ASTM D-7701	%	99.6	95.3
Residual Low-Head	ASTM D-7701	gpm	<0.001	0.004
CBR Puncture	ASTM D-6241	lbs.	97.98	93.29

Dirtbag® Seam Test Results (under ASTM D4884)

NonWoven Dirtbag	Woven Dirtbag
Maximum Load 786 lbs	Maximum Load 934 lbs
Maximum Strength 1178 lb/ft	Maximum Strength 1402 lb/ft
NOTE: Each test result was derived from a material failure rather than a stitch failure.	

All properties are Minimum Average Roll Value (MARV) except the weight of the fabric, which is given for information purposes only. Depending on soil conditions and filtration requirements, additional geotextile options are available. All test methods are ASTM or industry standard, and have been verified by a third party testing facility. Test data is available upon request.



800.448.3636
acfenvironmental.com

Dirtbag^{HD} and Dirtbag^{SD} Tube are also available from ACF.



WVWA ESC AS&S
Appendix 2 - Non-VESCH Measures

DIRTBAG

PUMPED SEDIMENT REMOVAL SYSTEM

SEDIMENT & PERIMETER CONTROL



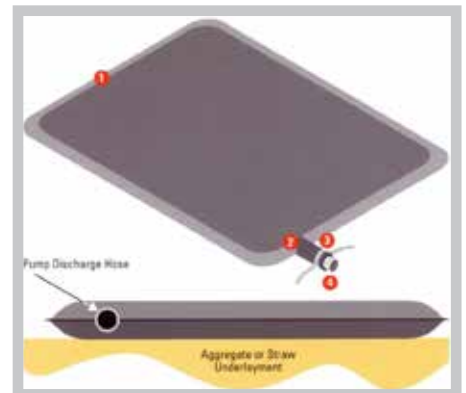
Retains the silt, sand and fines while allowing the filtered water to drain out into the drainage system.



The ACF Dirtbag® collects sand, silt and fines, while regulating that enters streams, surrounding property and storm sewers. ACF can make custom Dirtbags® to suit your needs. ACF Environmental manufactures the Dirtbag® using a variety of woven and nonwoven geotextile fabrics. We can produce any size, dimension, or fabric weight requested.

Each standard Dirtbag® has a fill spout large enough to accommodate a 4" discharge hose. Straps are attached to secure the hose and prevent pumped water from escaping without being filtered. To increase the efficiency of filtration, place the bag on an aggregate or haybale bed to maximize water flow through the surface area of the bag. Dirtbag® is full when it no longer can efficiently filter sediment or pass water at a reasonable rate. Flow and removal rates will vary depending on the size of Dirtbag®, the type and amount of sediment discharged into Dirtbag®, the type of surface, rock or other substance under the bag. Under most circumstances Dirtbag® will accommodate flow rates of 500 gallons per minute. Use of excessive flow rates or overfilling Dirtbag® with sediment will cause ruptures of the bags or failure of the hose attachment straps.

The ACF Dirtbag®GS has a sewn in mesh pocket to hold the GeoScrub Bubbles (effervescent tablets). These effervescent tablets provide a significant reduction in turbidity, and in offsite transport of sediment. Tablet quantity varies by size.



Advantages:

- Higher flow rate
- Higher removal rate
- Smaller openings
- Reduction in turbidity
- Reduction in off-site transport of sediment



For more information about Sediment Perimeter Control, contact Inside Sales at 800.448.3636 or email at info@acfenv.com

WVWA ESC AS&S
Appendix 2 - Non-VESCH Measures



80Z. SPECIFICATIONS

LET'S GET IT DONE

1.0 Description

- 1.1** This work shall consist of furnishing, placing and removing Dirtbag® pumped sediment control device as directed by the design engineer or as shown on the contract drawings. Dirtbag® pumped-silt control system is marketed by:

ACF Environmental, Inc.
2831 Cardwell Road
Richmond, VA 23234
Phone: 800.448.3636
Fax: 804.743.7779

2.0 Materials

2.1 Dirtbag®

- 2.1.1** The Dirtbag shall be manufactured using a polypropylene 8 oz. non-woven geotextile sewn into a bag with a double needle, using a high strength thread.
- 2.1.2** Each standard Dirtbag has a fill spout large enough to accommodate a 4" discharge hose. Straps are attached to secure the hose and prevent pumped water from escaping without being filtered.
- 2.1.3** The non-woven geotextile shall meet or exceed the following properties:

Property	Test Method	Units	Test Results
Weight	ASTM D-3776	oz/yd	8
Grab Tensile	ASTM D-4632	lbs.	205
CBR Puncture	ASTM D-6241	lbs.	525
Flow Rate	ASTM D-4491	gal/min/ft ²	90
Permittivity	ASTM D-4491	sec. ⁻¹	1.4
UV Resistant	ASTM D-4355	%	70
AOS % Retained	ASTM D-4751	US Sieve	80

2.1.4 Dirtbag® Testing Results

Property	Test Method	Test Results
Overall Bag Removal Efficiency (including initial filling)	ASTM D-7880	97.55%

All properties are Minimum Average Roll Value (MARV) except the weight of the fabric, which is given for information purposes only. Depending on soil conditions and filtration requirements, additional geotextile options are available. Please call our engineering staff for solutions.

3.0 Construction Sequence

- 3.1.1** To install Dirtbag on a slope so that incoming water flows downhill through Dirtbag without creating more erosion, strap the neck of the Dirtbag tightly to the discharge hose. To increase the efficiency of filtration, place the bag on an aggregate or hay bale bed to maximize water flow through the surface area of the bag.
- 3.1.2** Dirtbag is full when it no longer can efficiently filter sediment or allow water to pass at a reasonable rate. Flow rates will vary depending on the size of the Dirtbag, the type and amount of sediment discharged into the Dirtbag, the type of ground, rock, or other substance under the bag and the degree of the slope on which the bag lies. Under most circumstances, the Dirtbag will accommodate flow rates of 500 gallons per minute. Use of excessive flow rates or overfilling Dirtbag with sediment will cause the bag to rupture or will cause failure of the hose attachment straps.

Dirtbag must be monitored during use!

- 3.1.3** Dispose Dirtbag as directed by the site engineer. If allowed, Dirtbag may be cut open and the contents seeded after removing visible fabric. Dirtbag is strong enough to be lifted with optional straps if it must be hauled away. Off site disposal may be facilitated by placing the Dirtbag in the back of a dump truck or flatbed prior to use and allowing the water to drain from the bag while in place, thereby eliminating the need to lift the Dirtbag.

ACF Environmental is not liable for failures or misuse of Dirtbag.

Dirtbag^{HD} and Dirtbag^{SD} Tube are also available from ACF.



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WVWA ESC AS&S
Appendix 2 - Non-VESCH Measures



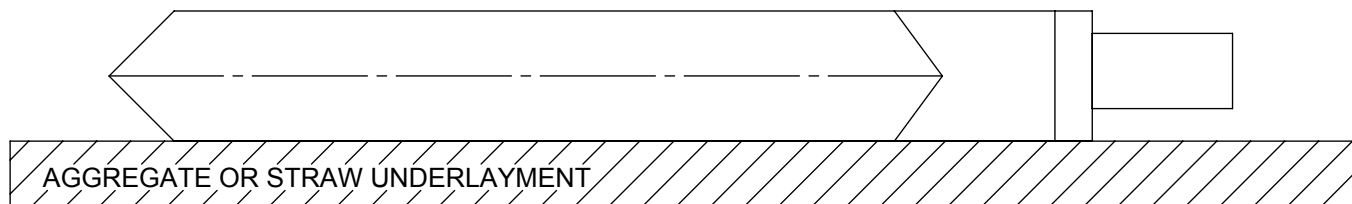
TOP VIEW



NOTES:

- 1) DIRTBAG TO BE PLACED ON AGGREGATE OR STRAW
- 2) SEAMS MUST BE HIGH STRENGTH DOUBLE STITCHED "J" SEAMS
- 3) SEAM MUST BE TESTED UNDER ASTM D-4884. ACF TEST RESULTS AVAILABLE UPON REQUEST

CROSS SECTION



DB55 FABRIC PROPERTIES

PROPERTY	TEST METHOD	MARV
TENSILE STRENGTH	ASTM D-4632	205 LBS
ELONGATION	ASTM D-4632	50%
CBR PUNCTURE	ASTM D-6241	525 LBS
UV RESISTANCE	ASTM D-4355	70%
AOS	ASTM D-4751	80 US SIEVE
PERMITTIVITY	ASTM D-4491	1.4 SEC-1
FLOW RATE	ASTM D-4491	90 GPM/SF



CORPORATE OFFICE:
 2831 CARDWELL ROAD
 RICHMOND, VA 23234
 PH: 800-448-3636
 WWW.ACFENVIRONMENTAL.COM

ACF DB55 DIRTBAG

FOR ADDITIONAL INFORMATION PLEASE CONTACT ACF ENVIRONMENTAL
 PH: 800-448-3636 / WWW.ACFENVIRONMENTAL.COM

WVWA ESC AS&S

STRAP TO EXTEND
PAST CORNER OF
BAG INTO 6" LOOP
(TYP. PER 4)

TOP VIEW

LIFT STRAP FOR
REINFORCEMENT

WIDTH

DIRTBAG

SEWN IN NECK

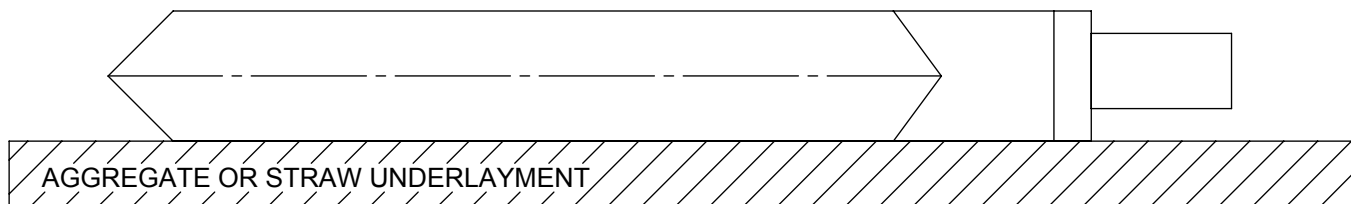
LENGTH

OPENING
ACCOMODATES UP
TO 4" DISCHARGE
HOSE

NOTES:

- 1) DIRTBAG TO BE PLACED ON AGGREGATE OR STRAW
- 2) SEAMS MUST BE HIGH STRENGTH DOUBLE STITCHED "J" SEAMS
- 3) SEAM MUST BE TESTED UNDER ASTM D-4884. ACF TEST RESULTS AVAILABLE UPON REQUEST

CROSS SECTION



DB55 FABRIC PROPERTIES

PROPERTY	TEST METHOD	MARV
TENSILE STRENGTH	ASTM D-4632	205 LBS
ELONGATION	ASTM D-4632	50%
CBR PUNCTURE	ASTM D-6241	525 LBS
UV RESISTANCE	ASTM D-4355	70%
AOS	ASTM D-4751	80 US SIEVE
PERMITTIVITY	ASTM D-4491	1.4 SEC-1
FLOW RATE	ASTM D-4491	90 GPM/SF



CORPORATE OFFICE:
2831 CARDWELL ROAD
RICHMOND, VA 23234
PH: 800-448-3636
WWW.ACFENVIRONMENTAL.COM

ACF DB55 (80Z) DIRTBAG

FOR ADDITIONAL INFORMATION PLEASE CONTACT ACF ENVIRONMENTAL

WVWA ESC AS&S

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Appendix 3
WVWA ESC Inspection Form (next page)



WESTERN VIRGINIA WATER AUTHORITY
Erosion & Sediment Control Inspection Form

WVWA ESC Report
 V. 2019-01

Project Name: _____ Project Location: _____
 RLD Name: _____ RLD Cert. #: _____
 Certified ESC Inspector Name: _____ Date/Time of Inspection: _____

Inspection Type: ☐ Weekly ☐ Complaint ☐ Rainfall Event (Date) _____

Stage of Construction: ☐ Installation of ESC Measures ☐ Finish Grading/Restoration
☐ Clearing/Grubbing ☐ Final Stabilization
☐ Active/Under Construction ☐ Other: _____

Item#	State/Local Regulation ⁽¹⁾	Violation		Description and Location of Problem/Violation ⁽²⁾ , Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	

- (1) Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), or Western Virginia Water Authority Annual Standards & Specifications.
 (2) Note whether or not off-site damage resulting from the problem/violation was evident during the inspection.

REQUIRED CORRECTIVE ACTION DEADLINE DATE: _____ (DD/MM/YY) Re-inspection Date: _____ (DD/MM/YY)

The required corrective action deadline date applies to all violations noted on this report. If listed violation(s) currently constitute non-compliance and/or required corrective actions are not completed by the deadline, a Notice to Stop Work order pursuant to Contract General Conditions may be issued to the entity responsible for executing the plan on the above project.

Inspector: _____ Signature _____ Date _____

Acknowledgement of on-site report receipt: _____ (print) _____ (signature) _____ (date)

This report will be provided to the following parties via mail, fax, or e-mail within 24 hours of inspection: